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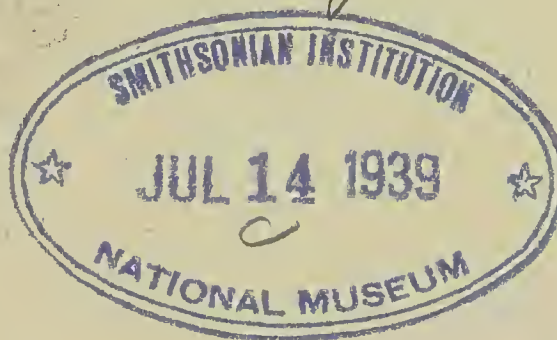
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LEPIDOPTERA INDICA.

BY

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LEPIDOPTERA INDICA.

Sub-family NYMPHALINÆ (continued).

Genus BIMBISARA.

Bimbisara, Moore, Lep. Indica, iii. p. 146 (1898).

Neptis (part), Auctorum.

Neptis (sect. 2, part), Felder, Neues Lep. p. 30 (1861).

IMAGO.—Wings comparatively more elongated and narrower than in the species of typical *Neptis* (*Aceris*, etc.). *Forewing* elongated, subtriangular; costa slightly arched from the base, exterior margin slightly oblique and scalloped, posterior margin strongly recurved; first subcostal branch emitted at one-third before end of the cell, second at one-ninth before the end; discocellulars extremely short, both outwardly-oblique; cell open; lower median emitted at half-way before the opposite discocellulars. *Hindwing* elongate, triangular; anterior margin very convex and oblique apically, exterior margin very obliquely convex, scalloped; with a broad glossy-white costal band and a medially-disposed unglossed brownish-grey patch extending from costal vein to below base of subcostals; costal vein ending at about one-fourth before the apex; precostal vein short, bent outward near end; subcostal branch and radial at a lengthened but equal distance from the costal vein; cell area broad, open. *Body* moderately stout; palpi slender, laxly hairy; antennæ with a lengthened slender club; eyes naked.

TYPE. B. Sankara [*Amba*].

BIMBISARA CARTICA.

Neptis Cartica, Moore, Proc. Zool. Soc. 1872, p. 562, ♂ ♀. de Nicéville, Butt. of India, etc., ii. p. 89 (1886)—*Dry-season*.

Neptis Carticoides, Moore, Trans. Ent. Soc. 1881, p. 309. de Nicéville, l.c. p. 90 (1886)—*Wet-season*.

Dry-season brood (Plate 287, fig. 1, 1a, b, ♂ ♀).

IMAGO.—Male and female. Upperside dark fuliginous-black, with blacker
VOL. IV. January 2nd, 1899. B

intervening spaces between the veins; cilia slightly alternated with white; markings fuliginous-white. *Forewing* with an elongated discoidal streak, which is broadly indented at upper end of the cell; a transverse discal excurved macular band, composed of three subapical spots, of which the upper is minute, slender, and divided by the third subcostal veinlet, the two next somewhat elongate, and decreasing in size, and four lower spots, the first of which is between the upper and middle medians, small and dentate, the second larger and broadly conical, the third broadly triangular, the lowest being narrow and slightly expanded on the posterior margin; these are bordered outwardly by a slender pale brownish-white inner-submarginal wavy line, a broader submarginal lunular line—which is almost white in the female, and then by a marginal slender line. *Hindwing* crossed by a broad inner-discal band, and a narrower more diffused outer band, between which is a pale brown medial-discal sinuous fascia, and beyond a marginal slender line. Underside dark ferruginous; markings as above, tinged with pinkish-white, the three marginal lines on *forewing* more prominent and lilacine-white. *Hindwing* also with a broad basal pinkish-white band, the medial discal sinuous fascia and marginal line lilacine-white. *Body* and palpi above, blackish; palpi and thorax beneath, forelegs and middle and hind femora pale grey; abdomen beneath and middle and hind tibiae and tarsi pale greyish-ochreous; antennae blackish above, tip and beneath reddish.

Expanse, ♂ ♀ $2\frac{4}{10}$ to $2\frac{8}{10}$ inches.

Wet-season brood (Plate 287, fig. 1, c, d, ♂).

IMAGO.—Male. Smaller than dry-season form; markings similar. Upperside dark fuliginous-brown, with blackish intervening spaces between the veins. *Forewing* with a narrower and more sullied fuliginous discoidal streak and subapical spots, the latter being smaller, the lower discal spots half the size of those in dry-season examples, the upper one being minute, the next triangular, and the two lower narrow. *Hindwing* with the inner-discal white band narrower, the outer-discal band much sullied with fuliginous. Underside of a darker ground-colour than *dry-season* form, the markings narrower, as above, otherwise the same.

Expanse, ♂ 2 inches.

HABITAT.—Nepal; Sikkim; Khasia and Naga Hills.

DISTRIBUTION.—Several specimens of the dry-season form were taken in Nepal by the late General G. Ramsay, of which we possess examples of both sexes. Mr. de Nicéville records it as “rather a rare species in Sikkim, but occurs from April to October” (*l.c.* 89). “It is found in the lower valleys of Sikkim throughout the warm weather, but is certainly not a common species” (*id.* Sikkim Gaz. 1894, 137). Numerous specimens of the dry-season form have been received from the

Khasia Hills by Colonel C. Swinhoe. The type specimen of the wet-season form (*Carticoides*) and a second male, from Darjiling, is also in our possession. A male of the wet-season form is also in the British Museum, and one from Sikkim in Mr. W. Rothschild's collection. Mr. de Nicéville also records "a single male of the latter form, in the Indian Museum, Calcutta, taken in Sikkim by Mr. Otto Möller" (Butt. Ind. ii. 90).

Of our illustrations of this species on Plate 287, figs. 1, 1a, b, are from the type male and female *Cartica*—the dry-season form, and figs. 1, c, d, from the type male *Carticoides*—the wet-season form.

BIMBISARA BURMANA (Plate 287, fig. 2, 2a, ♂).

Neptis Burmana, de Nicéville, Journ. Asiatic Soc. Bengal, 1886, p. 251, pl. 9, fig. 9.

IMAGO.—Male. Upperside black, with prominent white markings. *Forewing* with the discoidal streak narrow and deeply indented (or entirely divided in some) at end of the cell; the discal series of spots well separated, somewhat smaller and more rounded than in *B. Cartica*, the three marginal lines distinct, but narrower, the middle line white. *Hindwing* with the inner-discal band somewhat narrower than in *B. Cartica*, the outer-discal band prominent, and somewhat macular; marginal line pale. Underside darker ferruginous than in *Cartica*, markings as above, all very prominent, and pinkish-white. *Hindwing* also with a broad pinkish-white basal band, and a slightly-defined medial discal sinuous fascia.

Female. Upperside as in male; the markings less prominent and somewhat sullied-white. Underside as in male.

Expanse, ♂ $2\frac{4}{10}$, ♀ $2\frac{4}{10}$ to $2\frac{8}{10}$ inches.

HABITAT.—Burma; Upper Tenasserim.

DISTRIBUTION.—Described by Mr. de Nicéville from two males in Col. Marshall's collection, "both taken by Capt. C. T. Bingham, one on the Donat Range in January, the other at Sekkam, Thoungyeen, in February" (de N. l.c. 251). Specimens of both sexes, taken at Tilin Yaw, February, March, and April, by Capt. E. Y. Watson, during the Chin-Lushai Expedition, are in the British Museum. Col. C. H. E. Adamson has a male taken at Toungya, Sekkam, in February. We possess two males from the Upper Mekong, Shan States, Burma, taken by Mr. R. Roberts, C.E.

BIMBISARA NASHONA (Plate 288, fig. 1, 1a, b, c, ♂ ♀).

Neptis Nashona, Swinhoe, Ann. and Mag. Nat. Hist. 1896, p. 357.

IMAGO.—Male and female. Upperside olivescient fuliginous-black; markings

fuliginous-white; cilia alternated with white. *Forewing* with an elongated entire discoidal streak which extends half-way along the upper median veinlet and slightly below its base; the subapical spots are well-separated and broader than in *pseudovikasi*, the three lower discal decreasing spots being rounded, the lowest not expanding on the margin; the inner submarginal line is lunular, not sinuous, the outer lines broader. *Hindwing* with the inner-discal band broader than in *pseudovikasi*, and somewhat macular, the outer-discal band being also much broader, diffused, and sullied; the marginal line distinct. Underside chestnut-red, paler than in *pseudovikasi*, with lower discal dusky intervening spaces; the markings as above, slightly broader and lilacine-white, the basal lilacine fascia broad and prominent; no subbasal fascia. *Body* and palpi above black; palpi and thorax beneath, forelegs, middle and hind femora grey; abdomen beneath, middle and hind tibiæ and tarsi pale greyish-ochreous; antennæ black, tipt with red.

Expanse, ♂ $2\frac{4}{10}$, ♀ $2\frac{7}{10}$ inches.

HABITAT.—Cherra Punji; Khasia Hills.

DISTRIBUTION.—So far as is yet known this species is restricted to the district of the Khasia Hills, from whence Col. C. Swinhoe has received numerous specimens.

BIMBISARA SANKARA.

Wet-season brood (Plate 289, fig. 1, 1a, b, c, ♂ ♀).

Limenitis Sankara, Kollar, Hugel's Kaschmir, iv. 2, p. 428, ♀ (1844). de Nicéville, Butt. of India, etc., ii. p. 175 (1886).

Athyma Sankara, Westwood, Gen. D. Lep. ii. p. 274 (1850).

Neptis Sankara, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 350.

Neptis Amba, Moore, Proc. Zool. Soc. 1858, p. 7, pl. 49, fig. 4, ♂. de Nicéville, Butt. India, etc., ii. p. 88 (1886).

IMAGO.—Male. Upperside fuliginous-black; markings white; cilia alternated with white. *Forewing* with an elongated discoidal streak, which is indented at the upper end of the cell; an excurved transverse discal broad macular band, composed of a slender costal streak divided by the second subcostal veinlet, two elongated subapical somewhat oval spots, a very small more or less obscurely defined dentate spot, a short small dentate spot, a large broad ovate spot, a broad triangular spot, and lastly a narrower longer spot on posterior margin; beyond is a submarginal obscure black-bordered pale brown lunular line, and a less distinct marginal slender line. *Hindwing* crossed by a broad inner-discal band, and a narrow outer-discal lunular band, followed by an indistinct pale brown marginal lunular line, the submarginal band being sometimes sullied with pale brown. Underside rich dark ferruginous; markings as above, but somewhat broader and all pinkish-white,

including the two marginal lunular lines on both wings. *Hindwing* also with a narrow pinkish-white basal and a subbasal fascia, and a less-defined medial discal sinuous fascia.

Female. Upperside as in male; markings the same, but in some examples slightly sullied yellowish-white. Underside as in male. *Body* and palpi above fuliginous-black; palpi and thorax beneath, forelegs, middle and hind femora greyish-white; abdomen beneath and middle and hind tibiæ and tarsi pale ochreous-white.

Expanse, ♂ $2\frac{8}{10}$, ♀ 3 inches.

Dry-season brood (Plate 289, fig. 1d, e, f, g, ♂ ♀).

Neptis Amboides, Moore, Proc. Zool. Soc. 1882, p. 241, ♂ ♀.

Smaller than wet-season brood. Male. Upperside. Ground-colour duller black. *Forewing* with the discoidal streak broader, the discal spots also broader and more compactly disposed. *Hindwing* with the discal band broader. Underside ground-colour somewhat paler and duller coloured; markings broad, as above, otherwise as in wet-season.

Female. Upperside; ground-colour duller black than in wet-season, the markings sullied white. Underside as in male.

Expanse, ♂ $2\frac{3}{10}$, ♀ $2\frac{4}{10}$ inches.

HABITAT.—Western Himalayas; Nepal.

NOTE.—We have identified Kollar's insect (*Sankara*) with that of *Amba*, from a coloured drawing of his type specimen in the Nat. History Museum at Vienna, kindly sent to us by Dr. Rogenhoffer.

DISTRIBUTION.—We possess a male of the wet-season form taken in Kashmir by the late Capt. R. Bayne Reed, two females from Naini Tal, and both sexes from Nepal, taken by the late Genl. G. Ramsay; we have also the type specimens of the dry-season form (*Amboides*), the males from Ruttun Pir, Kashmir, taken by Capt. Reed, and the female from Kangra, taken by the Rev. J. H. Hocking. There are specimens from Simla, Kangra, and Almora, in the British Museum. Mr. J. H. Leech possesses specimens from Sultanpur, Kulu, taken by Mr. A. G. Young, and from Dana, taken in August by Mr. MacArthur. Mr. L. de Nicéville records it as "a common species in Simla; specimens from Kulu Valley and Masuri are in the Indian Museum, Calcutta, and in Col. A. M. Lang's collection, from Kunawur. Mrs. Deane took it in Chini in June" (Butt. Ind. ii. 88). Mr. W. Doherty records it from the "Kali and Sarsu Valleys, 2000 to 5000 feet elevation, Kumaon" (J. A. S. Beng. 1886, 125).

HABITS OF IMAGO.—Mr. de Nicéville says that he "always met with it in beds of

streams" (Indian Agriculturist, July, 1880). Col. Lang states that "it has the same flight as *N. Astola*, but more fond of pitching on the ground in the shade of trees and rocks" (MS. Notes).

BIMBISARA QUILTA (Plate 290, fig. 1, 1a, ♂ (*dry-season*), fig. 1b, c, d, e, ♂ ♀ (*wet-season brood*)).

Neptis Quilta, Swinhoe, Annals of Nat. Hist. 1897, p. 408, ♂ ♀.

IMAGO.—Male and female. Upperside olivescient-black, the veins outwardly lined with olivescient greyish-brown. *Forewing* with the discoidal streak, and transverse discal bands on both wings, as in *B. Sankara*, but all narrower, smaller, and less prominent, those of the male, in the *dry-season* brood, being sullied-white, and of both sexes in the *wet-season* brood more or less olivescient-white; in some freshly-captured females the bands being slightly tinted with very pale yellowish-ochreous; the outer marginal lunular lines brownish-grey. Underside darker purpurescent ferruginous-brown; all the markings similar, but comparatively narrower, as above, and less prominent.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{8}{10}$, ♀ 3 inches.

HABITAT.—Sikkim; Bhotan; Jaintia, Garro and Naga Hills; Burma.

DISTRIBUTION.—The type specimens are recorded from Cherra Punji; Colonel Swinhoe has also examples from the Jaintia and Naga Hills; a male from the Garro Hills is in Mr. W. Rothschild's collection. We have it also from E. Pegu, taken by Mr. W. Doherty, and from Bhotan, taken by Mr. G. C. Dudgeon. Specimens from Sikkim, taken by Mr. Dudgeon in June, and from E. Pegu, 500 to 2000 feet elevation, taken by Mr. Doherty in March and April, are in the British Museum.

NOTE.—The female of *Pantoporia Zeroca* is, apparently, a mimic of this species.

BIMBISARA NAR (Plate 288, fig. 2, 2a, ♀).

Neptis Nar, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 349, pl. F. fig. 6, ♀.

IMAGO.—"Female. Upperside brownish-black, with blacker intervening bordering patches between the veins; cilia slightly alternated with white. *Forewing* with an elongated pale brownish-ochreous streak occupying lower half of the cell and joined to a discocellular triangular ochreous-white spot beyond; three subapical outwardly-oblique conjoined ochreous-white spots, their edges tinged with darker ochreous, the upper spot slender, very small; four inwardly-oblique ochreous-white spots, the two upper being discal, the others on posterior margin, the uppermost spot composed of a clump of ochreous scales only, the next rounded, the two

posterior divided by the submedian vein; beyond is a submarginal sinuous obscure pale brown line and then a marginal slender straight line. *Hindwing* crossed by a discal broad almost pure white band, which is anteriorly decreasing in width from the abdominal margin, but does not reach the costa; an obscure sullied brownish-ochreous narrower submarginal band, and a less defined narrow marginal line. Underside blackish-brown, with darker intervening spaces between the veins; all the white markings, as in upperside, suffused with pale violet-grey. *Forewing* with the discoidal streak entire, but indented anteriorly at end of the cell; the discal spots larger and whiter, the two outer lines broader, prominent, and purplish-white. *Hindwing* with a short basal costal pure white band, and a short subbasal pale violet-grey band, an outer discal narrow sinuous violet-grey band, the submarginal band and marginal line being also violet-grey. *Body* and palpi above brownish-black, abdomen with a broad pale violet-grey band; beneath and legs pale violet-grey.

Expanse, ♀ $2\frac{7}{10}$ inches.

HABITAT.—S. Andamans.

DISTRIBUTION.—Described by Mr. de Nicéville from two examples received from Mr. R. Wimberley, being the only specimens seen by him among many thousands of butterflies from Port Blair received during the last twelve years. A single female is in Mr. W. Rothschild's collection.

NOTE.—This species is probably mimicked by the female of *Pantoporia rufula*.

BIMBISARA PSEUDOVIKASI (Plate 291, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male and female. Both sexes comparatively larger than the Javan *Vikasi*. Upperside dark olivescient fuliginous-brown, with prominent blacker intervening discal patches. Darkest and more richly coloured on both upper and underside, and with more prominent markings, in the wet-season brood. *Forewing* with the indented discoidal pale sullied olivescient greyish-ochreous streak somewhat narrower, and its end more prolonged; the transverse discal excurved series of pale spots smaller, the subapical series being conspicuously narrower, slender and elongated in shape. *Hindwing* with the discal and both outer bands paler and slightly narrower. Underside brown with dark purple-brown interspaces between the markings; with all the bands, as above, comparatively narrower and purpurescent-white, the basal and subbasal pale lilacine fascia on hindwing distinct. *Body* and palpi above dark brown; palpi and thorax beneath, forelegs, middle and hind femora pale grey; abdomen beneath, middle and hind tibiæ and tarsi pale ochreous.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{8}{10}$ to 3 inches.

HABITAT.—Sikkim; Bhotan; Khasia and Garro Hills.

DISTRIBUTION.—We possess specimens from Sikkim, from Bhotan, taken by Mr. G. C. Dudgeon, and from Cherra Punji and Khasia Hills. A specimen from the Garro Hills is in Mr. W. Rothschild's collection. Colonel C. Swinhoe has received numerous examples from the Khasia Hills. Mr. de Nicéville records it, as *Vikasi*, as "a common species in Sikkim, occurring at low elevations almost throughout the year" (Sikkim Gazetteer, 1894, 137).

Mr. W. Doherty records *Vikasi* as "rare in the Sarju Valley at Kapkot, Kumaon, at 4000 feet elevation" (J. A. Soc. Bengal, 1886, 125). This latter locality may probably refer to the present species.

BIMBISARA HARITA (Plate 291, fig. 2, 2a, b, c, ♂ ♀).

Neptis Harita, Moore, Proc. Zool. Soc. 1874, p. 571, pl. 66, fig. 8, ♀. de Nicéville, Butt. of India, etc., ii. p. 92 (1886).

Neptis Vikasi, Distant, Rhop. Malayana, p. 152, pl. 16, fig. 13, ♀ (1883)—*nec* Horsf.

Neptis Vikasi, var. *Harita*, Distant, *id.* p. 444, pl. 43, fig. 8, ♂.

IMAGO.—Male and female. Upperside olivescient fuliginous-brown, with blacker intervening patches between the markings. *Forewing* with rather indistinct paler olivescient-brown narrow discoidal streak and dentate discocellular mark, two transverse discal series of obscure narrow pale black-bordered zigzag lunules, the upper and lower pair in each series being broadest, and the one between the middle and lower median of the inner series is broader and dentate in the female; and two submarginal similar slender lunular lines, these markings being somewhat more distinct in the female. *Hindwing* with a paler narrow inner-discal transverse band with dark outer border, beyond which is a blackish medial-discal macular fascia, and then a submarginal row of pale-bordered blackish dentate-lunules, these markings being most distinct in the female. Underside brighter olive-brown; markings as above; the cell-streak, discal, and outer lines being violet-white and most prominent in the female.

Expanse, 2 to $2\frac{4}{10}$ inches.

HABITAT.—E. Bengal; Assam; Cachar; Khasia Hills; Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—We possess the male and female type specimens from "Eastern Bengal." Mr. de Nicéville records "a single specimen in the Indian Museum, Calcutta, taken in the Dunseri Valley, Upper Assam, and a male from Cachar, taken in July by Mr. J. Wood-Mason" (Butt. Ind. 92). A female from Tezapore, Assam, is in Mr. R. H. F. Rippon's collection. Colonel C. Swinhoe possesses specimens from the Khasias. There are also Assam and Khasia examples in Mr. W.

Rothschild's collection. A female from Tounghoo, Burma, is in Mr. H. Grose-Smith's collection. A female taken by Mr. A. O. Hume at Malawoon, Burma, males from Hounghdraw Valley, Upper Tenasserim, taken in January by Capt. C. T. Bingham, and a female from Mergui, are in the British Museum Collection. Dr. J. Anderson also obtained it in the Mergui Archipelago in the cold season. Col. C. H. E. Adamson records specimens taken in Akyab, and Tenasserim (List, p. 20), of which we have examined examples from Tavoy, taken in November. The late Mr. A. R. H. Tucker took specimens at Andhiaza, north of Tavoy, nearly at sea-level, in October, 1891. A male from Malacca, taken by Capt. S. Pinwill, is in the British Museum. Mr. W. L. Distant records it from Province Wellesley, and Perak, in the Malay Peninsula (l.c. pp. 152, 444). Col. Swinhoe also has it from Perak, and Borneo. Mr. D. Cator possesses specimens taken at Sandakan, N. Borneo, in October, which we have verified.

Both sexes of this species may be distinguished from *B. Omeroda*, on the upperside, by its more obscurely defined markings, and on the forewing, in both the upper and underside, by the lower spots of the inner discal series being dentate in form, and on the hindwing by the submarginal row of blackish lunules.

BIMBISARA ANJANA (Plate 292, fig. 2, 2a, b, ♂ ♀).

Neptis Anjana, Moore, Trans. Ent. Soc. 1881, p. 309, ♂. de Nicéville, Butt. of India, etc., ii. p. 92 (1886). Distant, Rhop. Malayana, p. 445, pl. 36, fig. 11 (1886).

IMAGO.—Male. Upperside dark olivescient blackish-brown, with blacker intervening bordering patches between the veins; markings obscurely defined and of a sullied pale olivescient yellowish-ochreous; cilia slightly alternated with white. *Forewing* with a narrow elongated discoidal streak which is indented anteriorly above the middle median veinlet; a transverse discal excurved narrow macular band, the lower portion being very obliquely-disposed inward, the spots of the upper portion small, slender, but slightly dentate, those of the lower portion transversely narrow and ovate, the medial portion being linear; beyond is a submarginal very narrow lunular band, and a less-defined slender marginal line. *Hindwing* crossed by a narrow inner-discal band and a similar outer-discal recurved band, followed by a less-defined slender submarginal line. Costal border glossy violet-grey, extending medially to below the first subcostal veinlet and enclosing an oval pale ochreous-yellow patch of unglossed scales between base of costal vein and first subcostal. Underside dark purplish chestnut-red; discoidal streak and transverse bands, and lines, as above, but broader, and glossy purplish-white, or, in certain

lights, bluish-white. *Forewing* also with the discal interspaces darkest, and with a slender inner submarginal purplish-white lunular line. *Hindwing* also with a short basal purplish-white band, and a medial-discal sinuous band; each of the outer bands being also bent inward to the costa above the upper subcostal.

Female. Upperside as in the male, the markings somewhat broader and brighter pale olivescient yellowish-ochreous. Underside as in male.

Expanse, ♂ $2\frac{5}{10}$, ♀ $2\frac{6}{10}$ inches.

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—The type specimen was taken in Moulmain. A male from Meetan, and a female from Tenasserim taken in April by Col. Bingham, is in the British Museum. Mr. W. Doherty found it not uncommon in E. Pegu during March and April. "A male in the Indian Museum, Calcutta, was obtained by Col. C. T. Bingham in the Mepley Valley, Upper Tenasserim, and one from the Donat Range, taken in January, is in Major Marshall's collection" (de Nicéville, l.c. p. 92). It also occurs at Perak, Malay Peninsula. Specimens from Perak are in Col. Swinhoe's collection. Males from Labuan, and Sarawak, Borneo, are in the British Museum, and a male and female from Kinabalu, N. Borneo, is in Mr. W. Rothschild's collection. Mr. de Nicéville records it from Sumatra, where it is found only in the Hills at 3000 feet elevation" (J. As. Soc. Bengal, 1895, 409).

CHINESE AND INDO-MALAYAN SPECIES.—*Bimbisara Sinica* (Neptis Amba (part), Leech, Butt. of China, p. 199). Upperside blacker than in typical *Amba* (*Sankara*), the white discoidal streak on forewing and the two bands on hindwing comparatively narrower. On the underside these bands are also narrower, and there is only one narrow outer submarginal lunular line, in both sexes of *Amba* there are two. *Habitat.* W. China.—*Bimbisara Antonia* (Neptis Antonia, Oberthür, Etudes Entom. 1876, p. 22, pl. 4, fig. 3, ♂. *Syn.* Neptis Amba, var. Leech, Butt. China, p. 199, pl. 19, fig. 1, ♀ (1892). *Habitat.* Moupin, W. China.—*Bimbisara micromegethes* (Neptis micromegethes, Holland, Trans. Ent. Soc. Amer. 1887, p. 118. *Habitat.* Hainan.—*Bimbisara Omeroda* (Plate 292, fig. 1, 1a, b, c, ♂ ♀), Neptis Omeroda, Moore, Proc. Zool. Soc. 1874, p. 571). Male and female. Upperside dark olivescient fuliginous-brown, with blacker intervening spaces between the veins; banded with paler fuliginous brown; the upper series of transverse discal spots on forewing narrow, almost oval in the female, the lower series rounded in both sexes. Underside dull purpurescent-brown in male, brighter brown in female, with black intervening spaces between the markings, as above, the markings being pale fuliginous-brown in male and vioscent white in the female. Expanse, ♂ $2\frac{3}{10}$, ♀ $2\frac{3}{10}$ to $2\frac{4}{10}$ inches. *Habitat.* Penang; Singapore; Sumatra; Borneo. The type specimen of *Omeroda* now under examination, from Penang, a male from Sumatra

(Wallace) and a female from Singapore are in the Oxford University Museum. A male and female from Sumatra and a female from Borneo are in Mr. P. Crowley's collection. We possess both sexes from Borneo; females from Borneo and Sumatra are in Mr. H. Grose-Smith's collection. A male and female from Labuan, Borneo, are in the British Museum. Both sexes of *Omeroda* differ from the Javan species, *Vikasi*, on the upperside, in the discoidal streak, and discal bands, being comparatively narrower and of a pale fuliginous brown, in *Vikasi* they are sullied brownish-white; the discal series of spots on forewing are narrower, the lower spots being rounded, in *Vikasi* they are broadly dentate. On the underside the ground-colour is duller brown than in *Vikasi*, the streak and discal bands less prominent, especially in the male.—*Bimbisara Kheili*. Male. Upperside olivescient fuliginous-brown, with blacker interspaces between the veins. *Forewing* with a very slender sullied-white discoidal streak and point beyond the cell; two prominent pure white subapical oblique spots and a lower discal rounded similar white spot between the middle and lower median veinlets; a very indistinct slender sullied brownish-whitish short outwardly-oblique streak above the latter, and an inner-oblique similar streak below it; two submarginal very slender sullied brownish-whitish sinuous lines and a marginal regular line. *Hindwing* with a prominent white inner-discal band, a very slender medial-discal and an outer submarginal indistinct sullied brownish line, between which is a slightly more distinct inner submarginal slender lunulated line. Underside paler, with all the markings more defined. Female. Upperside as in male, with all the markings more prominent. Underside the same. Quite distinct from *Ilira* and *Omeroda*. Expanse, ♂ 2, ♀ $2\frac{4}{10}$ inches. Types in Coll. Rothschild. *Habitat*. Nias Island.—*Bimbisara Ilira* (Neptis Ilira, Kheil, Rhop. Nias, p. 24, pl. 3, fig. 13, 14, ♂ ♀ (1884). *Habitat*. Nias Island.—*Bimbisara Vikasi* (Neptis Vikasi, Horsfield, Catal. Lep. Mus. E. I. C. pl. 5, fig. 2, 2a, ♀ (1829). Staudinger, Exot. Schmett. pl. 50. Male and female. Upperside dark olivescient fuliginous-brown. *Forewing* with a rather broad pale sullied brownish-white discoidal streak, distinctly indented at upper end of the cell; discal excurved series of spots broadly dentate, broadest in female; a very slender inner submarginal sinuous line, a middle lunular line, and then an outer marginal even line. *Hindwing* with a moderately broad inner-discal and a narrow outer-discal band, also a slender less defined submarginal line and an obscure medial-discal line. Underside pale brown, with prominent dark purplish-brown interspaces between the markings, as above, which are tinged with purpurescent-white. Expanse, ♂ $2\frac{1}{10}$ to $2\frac{2}{10}$, ♀ $2\frac{4}{10}$ to $2\frac{6}{10}$ inches. *Habitat*. Java.—*Bimbisara Celebica* (Neptis Celebica, Wallace, MS.). Female. Larger than Java *Vikasi*. Upperside with all the markings obscurely defined, the upper and lower portions of the discal curved macular band on forewing somewhat narrower,

on the hindwing the narrow medial-discal pale line is broader and the outer-discal band much broader. Underside with all the markings and bands broader than on upperside, those on the hindwing conspicuously broader, and all being browner than in *Vikasi*. Expanse, $2\frac{9}{10}$ inches. Type in Hewitson Coll. British Museum. *Habitat*. Macassar.—*Bimbisara Palawanica* (Neptis Palawanica, Staudinger, Deuts. Ent. Zeit. 1889, p. 64). *Habitat*. Palawan.—*Bimbisara Nitetis* (Neptis Nitetis, Hewitson, Exot. Butt. iv. Nep. pl. 1, fig. 5, ♀ (1868). Semper, Reise Phil. Lep. p. 150, pl. 30, fig. 1—3, ♂ ♀. *Syn.* Neptis Vikasina, Staudinger, MS. *Habitat*. Mindanao, Philippines.—*Bimbisara Vibusa* (Neptis Vibusa, Semper, Reise Phil. Lep. p. 150, pl. 29, fig. 19, ♀). *Habitat*. S. Mindanao.

Genus PANDASSANA.

Pandassana, Moore, Lep. Indica, iii. p. 146 (1898).

IMAGO.—Male. *Forewing* subtriangular, rather short; costa very slightly arched at the base, apex obtuse, exterior margin very slightly convex and almost even, posterior margin slightly recurved; first subcostal branch emitted at fully one-third before end of the cell, second at one-tenth before the end; first discocellular outwardly-oblique, second concave; cell open. *Hindwing* conically-ovate; anterior margin gently arched towards the end, apex obtuse, exterior margin very obliquely-convex, scalloped; precostal vein abruptly bent outward; subcostal branch emitted near to costal, radial at nearly twice the distance from base of subcostal branch. *Body* moderately slender; palpi very slender, finely hairy; antennal club stout; eyes naked.

TYPE.—*P. fuliginosa*.

PANDASSANA FULIGINOSA.

Dry-season brood (Plate 293, fig. 1, 1a, b, c, ♂ ♀).

Neptis fuliginosa, Moore, Trans. Ent. Soc. 1881, p. 31. de Nicéville, Butt. of India, etc., ii. p. 90 (1886)—*Dry-season*.

Neptis Thamala, Moore, Journ. Linn. Soc. Zool. 1886, p. 36, pl. 3, fig. 1, ♀ — *Wet-season*.

IMAGO.—Male and female. Upperside dark fuliginous olive-brown. *Forewing* with a fuliginous ochreous-white entire discoidal streak, two very indistinctly defined spots situated between the bases of subcostal and lower radial veinlet, a transverse discal interrupted rather broad macular band, two slender submarginal lunular lines, and a less defined marginal line. *Hindwing* with a broad inner-discal and an outer-discal band, a less distinct slender intervening medial-discal line, and a similar outer marginal line. Underside paler fuliginous-brown, with markings as above, but more prominent and whiter, the subcostal vein of forewing basally,

being also whitish, the hindwing having also an additional subbasal band, a less defined shorter basal, and an additional outer marginal line. *Body* and palpi above brown, beneath and legs fuliginous-white; antennæ black, tip reddish beneath.

Expanse, ♂ 2, ♀ $2\frac{2}{10}$ inches.

Wet-season brood (Plate 293, fig. d, e, f, g, ♂ ♀).

Male and female. Upperside dark fuliginous olive-brown; markings slightly narrower than in *dry-season* brood. *Forewing* with a pale dusky brownish-ochreous entire discoidal streak, two small spots above end of the cell, two transverse discal curved macular bands, a submarginal narrower band, and a slender marginal line, the submarginal band with a large conical spot protruded between the radial and upper median. *Hindwing* with an inner-discal and an outer-discal slightly recurved brownish-ochreous band, between which is a slender paler band, and beyond is a similar submarginal band and a marginal line. Underside paler brown; markings as above, but of a yellowish-ochreous, the subcostal vein of forewing also ochreous, and the hindwing also with a subbasal and a short basal ochreous band.

Expanse, ♂ $1\frac{8}{10}$, ♀ $2\frac{2}{10}$ inches.

HABITAT.—Lower Burma; Tenasserim; Sumatra; Borneo.

DISTRIBUTION.—The type specimen of *fuliginosa* was taken at Moulmain by Major C. H. E. Adamson, and the types of *Thamala* in Mergui, in February, and at Pilai in March, by Dr. J. Anderson, and are in the Indian Museum, Calcutta. A female of the dry-season form from the Donat Range, Upper Tenasserim, taken in October, is in Mr. de Nicéville's collection, who also records it from "N.E. Sumatra" (J. Bombay, N. H. Soc. 1895, 408). A specimen from Borneo is in the British Museum, and one in Mr. D. Cator's collection from N. Borneo.

Of our illustrations of this species on Plate 293, figs. 1, 1a, b, c, are from male and female types of *dry-season* form, and fig. 1, d, e, from those of the wet-season form, kindly sent to me for this purpose, from the Calcutta Museum, by Mr. L. de Nicéville.

MALAYAN SPECIES.—*Pandassana Cura* (Neptis Cura, Weymer, Stett. Ent. Zeit. 1885, p. 265, pl. 1, fig. 5. *Habitat.* Nias Island.—*Pandassana Monata* (Neptis Monata, Weijenbergh, Pet. Nouv. Entom. 1874, p. 408; Snellen, Tijd. voor Entom. 1897, p. 141, pl. 6, fig. 3, ♂. *Habitat.* Banka Island.—*Pandassana Ebusa* (Neptis Ebusa, Felder, Wien. Ent. Mon. 1863, p. 112. Reise Novara, Lep. 111, pl. 56, fig. 7 (1867). *Habitat.* Mindanao, Philippines.

MALAYAN ALLIED GENERA. Genus BISAPPA.—Male. *Forewing* rather elongated, subtriangular; costa very much arched from the base, apex obtuse, almost rounded, exterior margin oblique and nearly even, posterior margin much recurved; cell area

broad, open; first subcostal branch emitted at one-fifth, and second at a short distance before end of the cell; discocellulars extremely short and outwardly oblique; base of upper radial almost touching the subcostal; submedian vein much recurved. *Hindwing* somewhat narrow and elongate, ovate; anterior margin much arched, apex rounded, exterior margin very obliquely convex and very slightly scalloped, anal angle rounded, abdominal margin short; with a short basal costal glossy white band, a less glossed medially-disposed pale area extending from the costal vein to below the subcostals, and enclosing a distinctly-defined dull brown patch of scales between the bases of the subcostals; precostal vein abruptly curved; radial emitted from lower subcostal at nearly equal distance from base of the latter and the costal. *Body* slender; palpi extremely slender, apical joint long; compactly clothed with fine short hairs beneath; antennal club elongated; eyes naked. *Type*. B. Neriphus.—*Bisappa Neriphus* (Neptis Neriphus, Hewitson, Exot. Butt. iv. *Neptis*, pl. 1, fig. 6, 7 (1868). *Habitat*. Sula.—*Bisappa Nirvana* (Neptis Nirvana, Felder, Reise Novara, Lep. iii. p. 426 (1867). *Habitat*. Celebes.—*Bisappa Sangira* (Neptis Sangira, Staudinger. *Habitat*. Great Sangir Island.

Genus MAROSIA.—Male. *Forewing* subtriangular; apex obtuse, exterior margin almost erect, posterior margin slightly recurved, first subcostal branch emitted at one-sixth before end of the cell, second at one-eighth beyond the cell; discocellulars short. *Hindwing* conically-ovate; anterior margin rather straight, apex obtuse, exterior margin very oblique and convex, slightly scalloped. Eyes naked. *Type*. M. Antara.—*Marosia Antara* (Neptis Antara, Moore, Proc. Zool. Soc. 1858, p. 4, pl. 49, fig. 2, ♀. *Habitat*. Celebes.—*Marosia Zenica* (Neptis Zenica, Swinhoe, Ann. Nat. Hist. 1897, p. 407. *Habitat*. Batchian.

Genus PALANDA.—Male. *Forewing* subtriangular; costa arched at the base, apex obtuse, exterior margin slightly convex, very slightly oblique, and even, posterior margin deeply recurved; first subcostal branch emitted at one-fifth before end of the cell, second close to the end; upper and middle discocellular very short; cell open; medians not widely apart. *Hindwing* narrowly triangularly-ovate; anterior margin long, very convex, apex obtuse, exterior margin very oblique, slightly convex and uneven, abdominal margin short; precostal vein abruptly bent outward; subcostal branch emitted very close to the costal, radial at four times the distance. *Body* slender; palpi very slender, very sparsely hairy, third joint long, pointed; eyes naked. *Type*. P. Illigera.—*Palanda Illigera* (Limenitis Illigera Eschscholtz, Kotzeb. Reise, iii. p. 212, pl. 8, fig. 17 (1821). *Athyma Illigera*, Moore, P. Z. S. 1858, p. 19, pl. 51, fig. 4. Semper Reis. Phil. Lep. p. 148, pl. 29, fig. 15, 8, ♂ ♀ (1889). *Syn*. Neptis Livilla, Wallengren, W. Ent. Mon. 1866, p. 36. *Habitat*. Luzon; Manilla.—*Palanda Illigerella* (Neptis Illigerella, Staudinger, D.

Ent. Zeit. 1889, p. 64. *Habitat.* Palawan.—*Palanda Bella* (Neptis Bella Staudinger, *id.* p. 61. *Habitat.* Palawan.—*Palanda Eschscholtzia* (Neptis Eschscholtzia, Semper, Reisen Philip. Lep. p. 149 (1889). *Habitat.* Luzon.

Genus STABROBATES.

Stabrobates, Moore, Lep. Indica, iii. p. 146 (1898).

Neptis (part), Auctorum.

Neptis (sect. 6), Felder, Neues Lep. p. 31 (1861).

IMAGO.—Male. *Forewing* elongated, subtriangular; apex rounded, exterior margin oblique, concave in the middle, almost even, posterior angle rounded, posterior margin much recurved; first subcostal branch emitted at one-third before end of the cell, second at one-ninth before the end; discocellulars outwardly oblique, both very short; cell open; middle and lower median very wide apart, lower median being emitted nearly opposite the first subcostal branch; submedian vein much recurved; posterior margin of the underside below the submedian vein glossy brownish-grey. *Hindwing* short, conically-triangular; anterior margin obliquely-convex beyond the middle, apex rounded, exterior margin obliquely convex and scalloped, anal angle obtuse; costal border glossy-grey, and a medially disposed unglossed patch from costal vein to lower subcostal; precostal vein rather long, bent outward before its middle; costal vein ending at one-fourth before the apex; radial and subcostal branch at equal distances from the costal vein. *Body* slender;* palpi long, slender, densely clothed with wide spreading fine long hairs; antennal club slender; eyes naked. *Type*.—S. Radha.

STABROBATES RADHA (Plate 294, fig. 1, 1a, b, c, ♂ ♀).

Neptis Radha, Moore, Catal. Lep. Mus. E. I. Company, i. p. 166, pl. 4a, fig. 4, ♂ (1857); *id.* Proc.

Zool. Soc. 1858, p. 6. de Nicéville, Butt. of India, etc., ii. p. 84 (1886).

Neptis Asterastilis, Oberthür, Etudes Entom. xv. p. 10, pl. 1, fig. 5, ♂ (1891).

IMAGO.—Male. Upperside brownish-black, with blacker intervening bordering spaces between the veins; markings yellowish-ochreous; cilia slightly alternated with white. *Forewing* with a prominent yellowish-ochreous elongated discoidal streak extending along lower half of the cell area to some distance above and below base of the upper median veinlet, the streak being slightly indented opposite the discocellulars; a very slender short streak divided by the second subcostal branch

* In *Stabrobates Viraja*, the male of the *dry-season* form possesses a conspicuous tuft of laxly exerted black (?glandular) scales of varied shapes, which is disposed laterally along the middle segments of the abdomen beneath. Not observable in specimens of *wet-season* form.

on costal margin, below which are two very indistinctly defined lunules; beyond which are three outwardly-oblique subapical spots, the upper being small, short, and divided by the third subcostal branch, the second broadly elongated, the third shorter and conical; below these are two large conjoined discal spots placed above and below the middle median veinlet, the upper one being narrow, the other broad and rounded; beneath these are two narrower conjoined inwardly-oblique spots ending on middle of posterior margin; beyond these is a transverse submarginal slightly-defined pale greyish-brown lunular line, its lower end being sometimes tinged with ochreous. *Hindwing* crossed by a rather broad yellowish-ochreous inner-discal band extending to the abdominal margin, and a narrower outer-discal lunular band, followed by a slightly-defined submarginal pale greyish-brown lunular line. Underside deep brownish-red, the ochreous markings as above, but paler and less defined. *Forewing* also with the lower discal interspaces suffused with black; the discoidal streak diffusedly extending below the median vein; a curved violet-grey streak crossing upper end of the cell; two transverse violet-grey lunular fasciæ inwardly-bordering the subapical spots, and a broader similar outer-bordering fascia; the submarginal line also being mostly violet-grey. *Hindwing* also with a broad violet-grey basal fascia, subbasal streaks between the veins, two transverse medial discal sinuous fasciæ and two submarginal narrower sinuous fasciæ.

Female. Upperside as in male, the yellowish-ochreous markings somewhat broader and paler. Underside as in male. *Body* and palpi above brownish-black; abdomen above with a slightly-defined basal greyish band; palpi, thorax and legs beneath grey; legs above and abdomen beneath pale yellowish-ochreous; antennæ black, tip ochreous beneath.

Expanse, ♂ $2\frac{8}{10}$ to 3, ♀ $3\frac{4}{10}$ inches.

HABITAT.—Nepal; Sikkim; Bhotan; Cachar; Khasia Hills; Naga Hills; Upper Burma.

DISTRIBUTION.—“This is a rare species. Mr. Möller has obtained a single specimen in Sikkim in the spring. I took a worn male at about 4000 feet elevation below Darjiling, in October, and Mr. Wood-Mason obtained a single male on Nemotha Peak, Cachar, in September” (de Nicéville *l.c.* 85). “Probably occurs in Sikkim throughout the warm months. Mr. Dudgeon has taken it several times at 5000 feet elevation, and finds that it is extremely fond of pitching on the same bush for several consecutive days. Its elevation extends to 7000 and 8000 feet, and he doubts its occurrence below 3000 feet” (*id.* Sikkim Gazetteer, 1894, 136). Mr. H. J. Elwes says it is “a rare species in Sikkim, which I have never taken myself, but it occurs between April and December at low elevations.” (Tr. Ent. Soc. 1888, 343). Mr. Elwes records “a single male, very pale in colour, from Bernardmyo, Upper Burma, and others from the Naga Hills, taken by Mr. W. Doherty”



1.



1a



1a



1b



1c



2



2a



1.



1^b



1^a



1^c



2



2^a



1.



1b



1a



1c



1e



1f



1d



1f

J.N.Fitch del. et lith.

Vincent Brooks, Day & Son Ltd. Imp.



1.



1a



1c



1e



1b



1d



1.



1b



1a



1c



2a



2c



2



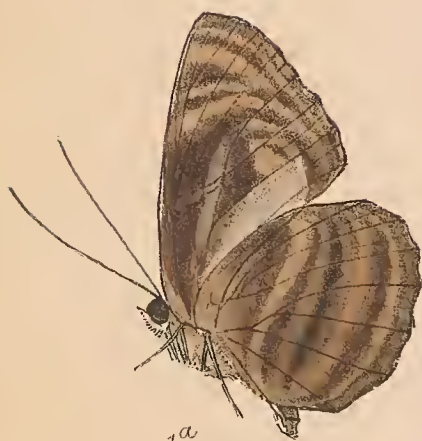
2b



1.



1^b



1^a



1^c



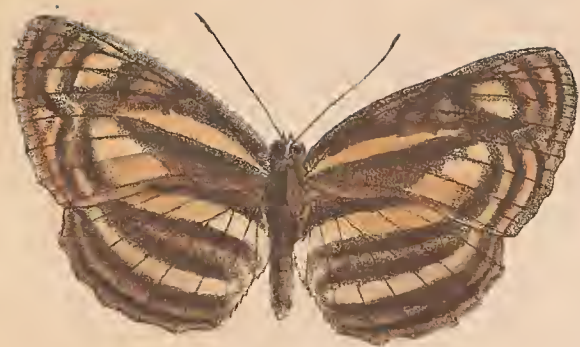
2^a



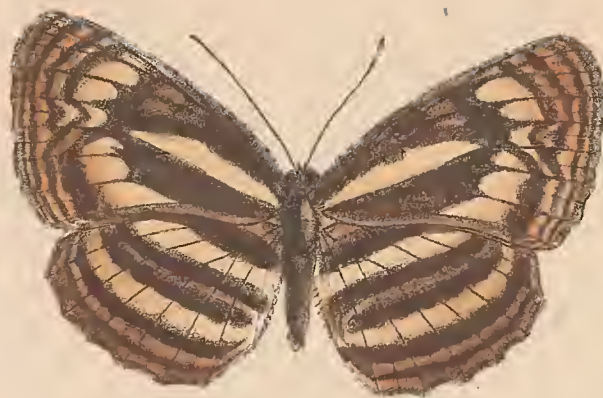
2



2^b



1.



1^b



1^a



1^c



1^e



1^g



1^d



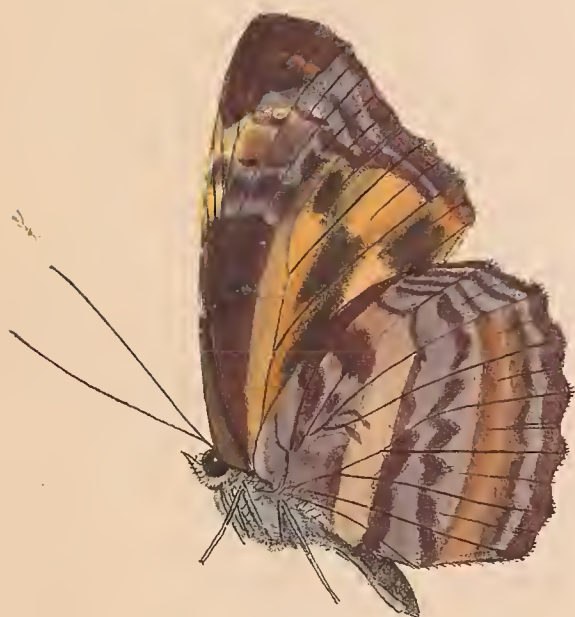
1^f

J.N.Fitch del, et lith.

Vincent, Brooks, Day & Son, Lit.^{rs} Imp



1.



1^a



1^c



1^b

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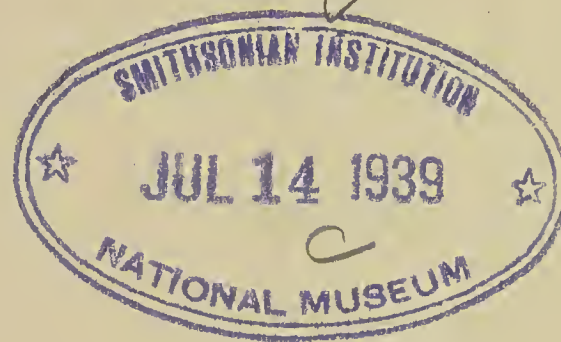
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(P. Z. S. 1891, 274). An example of the male, very pale in colour (probably *dry-season* form), taken by Mr. Doherty in Upper Burma, has been figured and described as *N. asterastilis*, by Mons. Oberthur. We possess both sexes from the late General G. Ramsay's Nepal collection. Colonel C. Swinhoe has received several of both sexes from Shillong and the Khasia Hills.

STABROBATES NARAYANA (Plate 295, fig. 1, 1a, ♂).

Neptis Narayana, Moore, Proc. Zool. Soc. 1858, p. 6, pl. 49, fig. 3, ♂. de Nicéville, Butt. of India, etc., ii. p. 87 (1886).

IMAGO.—Male. Upperside olivescient fuliginous-black, with blacker intervening bordering patches between the veins; markings white or sullied ochreous-white; cilia alternated with white. *Forewing* with a white elongated discoidal streak extending along lower area of the cell to a short distance above and base of the upper median veinlet, the streak widely indented opposite the discocellulars; three very small slender streaks divided by the subcostals, beyond which are three subapical outwardly-oblique spots, the upper short and vein-divided, the second elongated, the third short and conically-triangular, below these are two discal larger conjoined spots placed above and below the middle median, the upper one being narrow, the lower somewhat broadly-quadrate; beneath these are two smaller inwardly-oblique conjoined spots; beyond is a transverse submarginal lunular line, the upper part of which is pale fuliginous, the lower whitish. *Hindwing* crossed by a broad sullied-white inner-discal band, and a narrower outer-discal lunular band, followed by a very indistinctly-defined pale submarginal lunular line. Underside dull brownish-red; the white markings as above, but less prominent, and violaceous-white. *Forewing* also with the costal base and upper cell area pale yellowish-ochreous, the lower discal interspaces fuliginous; outwardly bordering the subapical spots are violaceous-white lunules; the submarginal lunular line also partly violaceous-white. *Hindwing* also with the veins basally, and basal interspaces below the costal and subcostal, a medial discal zigzag line, and two submarginal slender lines violaceous-white.

Female. Upperside brighter olivescient-black; markings pale ochreous-white. Underside as in the male. *Body* and palpi above fuliginous-black; palpi and thorax beneath, and forelegs white; middle and hind legs and abdomen beneath pale ochreous.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{7}{10}$ inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—The type specimen, and a male and female, from Naini Tal,

Kumaon, at 6500 feet elevation, taken by Col. A. M. Lang in May, is in the British Museum; also a female in the Hewitson collection. We possess two males from the Western Himalayas. Mr. de Nicéville records it as having been "taken by Col. Lang at Naini Tal, rarely, at from 5500 to 6500 feet elevation, in the middle of May" (J. A. S. Beng. 1888, 276). The Indian Museum, Calcutta, possesses specimens of both sexes from the Kulu Valley, taken in May by Mr. A. Graham Young, and others from Kunawur are in Col. Lang's collection. Mrs. Deane took a single female at Chini in June" (de Nicéville, *l.c.* 88).

STABROBATES NANA (Plate 295, fig. 2, 2a, ♂).

Neptis Nana, de Nicéville, Journ. Asiatic Soc. Bengal, 1888, p. 276, pl. 13, fig. 1, ♂.

IMAGO.—Male. Upperside. Both wings distinguished from *N. Narayana* by having all the markings bright yellow-ochreous instead of white. *Forewing* with the submarginal band narrower. Underside; both wings with the ground-colour and pale violet markings of a deeper and richer shade of colour. *Hindwing* with the submarginal band as above, narrower, the pale violet band between it and the discal band broader and better defined, and the marginal pale violet line nearer the margin.

Expanse, ♂ $2\frac{5}{10}$ inches.

HABITAT.—Sikkim; Bhotan.

DISTRIBUTION.—"There are three males in the collection of Messrs. Otto Möller and A. V. Knyvett, taken in April and June by their native collectors in Bhotan" (de N. *l.c.* 276). A male from Darjiling, taken by Col. Lidderdale, is in the British Museum.

STABROBATES MANASA (Plate 295, fig. 3, 3a, ♂).

Neptis Manasa, Moore, Cat. Lep. Mus. E. I. Company, i. p. 165, pl. 4a, fig. 2, ♂ (1857); *id.* Proc. Zool. Soc. 1858, p. 5. de Nicéville, Butt. of India, etc., ii. p. 87 (1886).

IMAGO.—Male. Upperside dark fuliginous-brown; markings pale yellowish-white; cilia alternated with white. *Forewing* with an elongated entire discoidal streak, which is continuous with the discal spots, extending elongatedly between the upper medians and there joins the lower discal spot, below which are the two inwardly-oblique conjoined spots on the posterior margin; from the costa before the subapical spots are three minute pure white costal spots placed obliquely outward; an outwardly-oblique subapical streak composed of a minute costal streak, an elongated fusiform spot and a third short somewhat quadrate spot, below which

is a very obscure small pale brown dentate spot; a submarginal obscure pale brownish-white lunular line. *Hindwing* crossed by a broad inner-discal band, a narrow outer-discal somewhat quadro-lunular band, between which is a medial discal obscure pale brown slender lunular line, and beyond a submarginal line. Underside pale dull yellowish-ochreous; markings as above, less defined, all pure white, the submarginal lines, and the medial and outer-discal band on the hindwing being suffused with pale lilac. *Forewing* also with the discoidal streak, discal and lower spots continued in an uninterrupted curved series to the posterior margin, the lower discal interspace being slightly suffused with fuliginous-brown. *Hindwing* also with a series of small lilacine-white spots between the costal vein and discal band. *Body* and palpi above fuliginous-brown, beneath and forelegs greyish-white; middle and hind legs pale greyish-ochreous; antennæ black.

Expanse, ♂ $2\frac{7}{10}$ inches.

HABITAT.—N. India.

DISTRIBUTION.—The type specimen, now in the British Museum, is the only example of this species we have seen. It was presented to the late East India Museum by Col. Buckley, but in what locality it was taken is unknown.

STABROBATES NYCTEUS (Plate 295, fig. 4, 4a, ♂).

Neptis Nycteus, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1890, p. 203, pl. D, fig. 7, ♂.

IMAGO.—Male. Upperside fuliginous-black; markings sullied white; cilia alternated with white. *Forewing* with a sullied-white somewhat fusiform elongated entire discoidal streak extending along lower area of the cell to beyond the base of upper median veinlet; above the middle of the streak, within the cell, is a very small slightly-defined whitish speckled spot; above the end of the streak are four small outwardly-oblique slender spots from the costa, divided by the subcostal veinlets; beyond are three subapical oblique spots, the upper small and narrow, the second much larger and its ends sullied with ochreous, the third being smaller and triangulate; below are two discal larger elongated conjoined spots, disposed between the medians, the upper one joining the lower end of the discoidal streak, both being disposed obliquely-outward; below these are two smaller narrow conjoined spots, disposed obliquely-inward on the posterior margin; beyond is a submarginal pale fuliginous-grey narrow lunular line. *Hindwing* crossed by a broad white inner-discal band, and a narrow submarginal anteriorly-attenuating fuliginous-white lunular band. Underside, ground-colour yellowish-ochreous, the white markings, as above, but somewhat broader, and their edges less sharply defined; the two series of subapical spots, and submarginal lunular band on both wings being distinctly

suffused with pale lilacine-grey; the discoidal streak, discal spots on the forewing, and discal band on hindwing, being pale yellowish-white. *Forewing* also with the upper discal and apical interspaces deep castaneous-red, the lower discal and submarginal interspaces blackish. *Hindwing* also with a subbasal lilacine-white broken streak below the costal vein; the discal white band bordered on both sides, and the submarginal lilacine-white lunular band inwardly bordered, with deep chestnut-red, the latter also outwardly bordered by pale chestnut-red.

Female. "Upperside. *Forewing* with the spot in the second median interspace very narrow, touching the second median veinlet, and well-separated from the discoidal streak, of exactly the same length as the spot below it, which latter is bounded above and below by the second and first median veinlets, the two spots together forming a perfect quadrangular oblong figure; other as in male. *Hindwing* with the discal band narrower than in male, the submarginal band wider and pure white instead of sullied. Underside, both wings very much paler than in the male, the castaneous bands almost obliterated, the ground-colour mostly very pale yellow." *Body* and palpi above fuliginous-black; beneath and legs greyish-white; antennæ black."

Expanse, ♂, ♀, $2\frac{4}{10}$ to $2\frac{6}{10}$ inches.

HABITAT.—Sikkim.

DISTRIBUTION.—"The type male was taken in Sikkim in June by Mr. G. C. Dudgeon, and the female in July, and a female in Mr. A. V. Knyvett's collection were all taken at Tonglo on the Singalelah Range, at an elevation of about 12,000 feet" (de N. l.c. 204). A male, in Colonel Swinhoe's collection, was taken by a native collector at "Lachin Lachoong, 8000 to 16,000 feet elevation." Mr. H. J. Elwes took "a single male in the forest near the Rangbi Jhora, on the road to Serail, at 6000 feet, in June" (Tr. Ent. Soc. 1888, 344). Has also been taken by Mr. G. C. Dudgeon at 7000 feet elevation in Daling.

STABROBATES ZAIDA.

Neptis Zaida, Doubleday and Hewitson, D. Lep. pl. 35, fig. 3; Westwood, *id.* p. 272 (1850). Moore, Proc. Zool. Soc. 1858, p. 6. de Nicéville, Butt. of India, etc., ii. p. 86 (1886).

Dry-season brood (Plate 296, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside fuliginous-black; markings pale ochreous-white, or very pale ochreous; cilia alternated with pale ochreous-white. *Forewing* with an elongated broad discoidal streak extending along lower area of the cell and ending in an acute point at some distance on the upper median veinlet, its upper edge entire and curved from the base, its apex below extending slightly within the basal inter-

space between the upper and middle medians; a subapical oblique-band composed of vein-divided spots, the upper on the costa being very slender, the other two broad, sometimes the lower extends over the lower radial; below is a large broad rounded or somewhat quadrate discal spot, disposed obliquely-inward and extending from half-way above the middle median to the lower median, and sometimes slightly over the latter veinlet, followed by a broad lower streak on the posterior margin; beyond is a slightly-defined submarginal pale line. *Hindwing* crossed by a broad inner-discal band and an outer-discal narrower somewhat lunulated band; a pale submarginal line also slightly apparent. Underside. Ground-colour pale yellowish-ochreous or pale reddish-ochreous; markings as above, but less prominent and whitish, the lower medial-discal interspace somewhat blackish; with the marginal line on both wings, and the outer-discal band on hindwing is tinted with lilacine-white. *Hindwing* also with a slightly-defined basal and subbasal pale yellowish-ochreous fascia, and a similar-coloured lunular fascia between the discal and outer band.

Female similar to male, with the markings somewhat broader.

Body and palpi above fuliginous-black; palpi beneath brown, but whitish at the sides; body beneath and legs pale yellowish-ochreous.

Expanse, ♂ $2\frac{7}{10}$, ♀ 3 inches.

Wet-season brood (Plate 296, fig. 1d, e, ♂).

Upperside; ground-colour blacker than in dry-season; the discoidal streak and bands pale ochreous or pure ochreous. Underside; ground-colour reddish-ochreous or chestnut-red; all the markings pale ochreous, the subapical band and discal bands on hindwing washed with pale violet-pink.

Expanse, ♂ $2\frac{6}{10}$ inches.

HABITAT.—W. and E. Himalayas; ? Siam.

DISTRIBUTION.—“Specimens from Masuri, in Col. A. M. Lang’s collection, were taken in June at 7000 feet elevation, and others from Sikkim, in which the markings are almost pure white. In other Sikkim and Masuri examples the markings are pure ochreous, and there are intermediate specimens in the Indian Museum, Calcutta, taken by Mr. C. Templeton at Masuri” (de Nicéville, Butt. Ind. ii. 87). A male and female taken at Masuri in May, by S. Robson, is in Mr. W. Rothschild’s collection. Examples from Darjiling, taken by Mr. Lidderdale, are in the British Museum. “In Sikkim this rare and beautiful species is hardly ever taken by the native collectors now, but I found it not uncommon in June and July, in the forest above Rangbi at about 6000 feet elevation. The males fly about the tops of Oak trees in the rare gleams of sunshine, sitting on the leaves, but descend seldom

to the ground" (H. J. Elwes, Tr. Ent. Soc. 1888, 343). A male of the wet-season form, with pure ochreous markings, labelled "Siam," is in Mr. H. Grose-Smith's collection.

STABROBATES ANANTA.

Neptis Ananta, Moore, Catal. Lep. Mus. East Ind. Company, i. p. 166, pl. 4, a, fig. 3 (1857); *id.* Proc. Zool. Soc. 1858, p. 5; Anderson's Zool. Res. Yunan Exp. p. 294 (1878). de Nicéville, Butt. of India, etc., ii. p. 85 (1886).

Wet-season brood (Plate 297, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside dark brownish-black; markings deep yellowish-ochreous; cilia slightly alternated with white. *Forewing* with an elongated narrow discoidal streak extending along lower area of the cell and ending in a point some distance on the upper median veinlet, the streak being very slightly angled below at the middle median, and its upper edge indented above the angle; a subapical oblique-series of three spots, the upper slender and divided by the third subcostal veinlet, the second elongate and obliquely indented on its outer edge, the third being short, broad and conical; these are joined by a more or less slightly-defined pale slender streak to a larger discal inwardly-oblique rounded spot cut by the middle median veinlet, below which is a narrower spot cut by the submedian on the posterior margin; beyond is a slender submarginal slightly-apparent pale brown line. *Hindwing* crossed by a slightly broader inner-discal band, and a narrower outer band, followed by a slightly-apparent pale brown submarginal line; a similar line also slightly apparent between the discal bands; on the costa towards the base is a broad glossy white patch, the base of subcostals also being lined with white. Underside. Ground-colour bright ochreous-red or chestnut-red. *Forewing* with the discoidal streak and discal spot pale yellowish-ochreous; the subapical spots, the spot on posterior margin, and two submarginal broken lines, and the end of discoidal streak bluish-grey; lower discal interspaces slightly fuliginous-black. *Hindwing* with the inner-discal band pale bluish greyish-white; the outer-discal band, submarginal line, medial-discal sinuous line, and a broad basal costal band bluish-grey; the veins also lined with bluish-grey. *Body* and palpi above black; body and palpi beneath, forelegs, middle and hind femora bluish-grey; middle and hind tibiæ and tarsi pale ochreous; antennæ black.

Female. Upperside. Ground-colour paler fuliginous-black; markings as in male, but somewhat broader and paler. Underside also somewhat paler; markings as in male.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{6}{10}$ to $2\frac{8}{10}$ inches.

Dry-season brood (Plate 297, fig. 1, d, e, f, g, ♂ ♀).

Male. Upperside paler brownish-black than in *wet-season* brood; markings somewhat broader and of a paler yellowish-ochreous. Underside. Ground-colour paler ochreous-red; all the markings less prominent.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$ inches.

HABITAT.—W. and E. Himalayas; Assam; Silhet; Khasia and Naga Hills; Burma; Malay Peninsula.

DISTRIBUTION.—This is rather a rare insect. Mr. de Nicéville “took it in the N.W. Himalayas at Kujiah near Dalhousie, and at Ulwas, Chumba, in wooded streams at the end of May. Mr. A. G. Young has taken it in Kulu at the same period, and Col. A. M. Lang took it at Kandloo in Kunawur, in July. Mr. C. Templeton took it at Masuri, Mr. J. L. Sherwill at Hulunguri in the Jorehat District of Assam in March, April, and June, and Mr. A. V. Knyvett has taken it in Sikkim and Bhotan” (Butt. Ind. ii. 86). Specimens from Sultanpur, Kulu, are in Mr. J. H. Leech’s collection. The Rev. J. H. Hocking records it as “very rare in Kulu” (P. Z. S. 1882, 241). Mr. W. Doherty took it in Ramganga Valley, Kumaon, at 2500 feet; rare” (J. A. S. Beng. 1886, 125). We possess specimens from Nepal taken by the late General G. Ramsay, a female from Ruttun Pir, Kashmir, taken by Capt. Bayne Reed; from Bhotan, taken by Mr. G. C. Dudgeon; and a male from the Khasias. Mr. de Nicéville records it as “very local in Sikkim, where I have never seen it on the wing. Mr. Elwes says it is found in the forests at 5000 to 6000 feet and at lower levels. He took it on the road to Pashok above Lopchu, in June. It is very common at 4000 feet and upwards in Daling” (Sikkim Gazetteer, 1894, 136). Mr. W. Doherty obtained it in the Naga Hills, and also in the Karen Hills, Burma, from 4000 to 6000 feet (P. Z. S. 1891, 274). Colonel C. Swinhoe has received several specimens from the Khasia Hills. We possess a male from the Upper Mekong, Shan States, Burma, taken by Mr. R. Roberts, C.E. A male from Perak, Malay Peninsula, is in Mr. W. Rothschild’s collection.

STABROBATES VIRAJA.

Neptis Viraja, Moore, Proc. Zool. Soc. 1872, p. 563, pl. 32, fig. 6, ♂. de Nicéville, Butt. of India, etc., ii. p. 86 (1886). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 351 (*larva*); *id.* 1896, p. 251, pl. 2, fig. 3 (*larva* and *pupa*).

Wet-season brood.

IMAGO.—Male and female. Upperside brownish-black; markings broad and deep yellowish-ochreous; cilia slightly alternated with white. *Forewing* with an

elongated broad entire discoidal streak, which is somewhat claviform in shape, and its lower end extending slightly for some distance below base of the upper median veinlet, and its upper edge very slightly indented at end of the cell; a subapical broad outwardly-oblique band, and an inwardly-oblique lower continuous broad band extending to the posterior margin; beyond which are two submarginal slightly-defined sinuous greyish-ochreous incomplete lines. *Hindwing* crossed by a broad inner-discal band, and an outer band, followed by a slightly-defined greyish-ochreous outer marginal line. Underside brownish-ochreous, with dusky-brown intervening discal spaces between the veins; discoidal streak and bands, as above, pale glossy virescent ochreous-white, their inner edges being suffused with pale ochreous. *Forewing* also with the inner marginal line entire and virescent-grey, the outer line less defined. *Hindwing* also with a short basal and a less-defined subbasal fascia, a medial-discal slender sinuous line, and the marginal line virescent-grey.

Female. Upperside as in male; markings the same. Underside darker and brighter brownish-ochreous than in male, with all the markings more prominent. *Body* and palpi above brownish-black; palpi and thorax beneath, and forelegs pale grey; middle and hind-legs, and abdomen beneath pale greyish-ochreous; antennæ black, tip reddish.

Expanse, ♂ $2\frac{2}{10}$, ♀ $2\frac{4}{10}$ inches.

Dry-season brood (Plate 298, fig. 1, larva and pupa; 1, a, b, c, d, ♂ ♀).

Male and female. Upperside with the discoidal streak and discal bands somewhat broader than in *wet-season* brood, the marginal lines on forewing yellowish-ochreous. Underside with the ground-colour paler brownish-ochreous than in *wet-season*, the cell-streak and discal bands broader, as above, but less defined. Male with a conspicuous tuft of laxly exerted black glandular scales of varied lengthened clavate shapes, disposed laterally along middle segments of abdomen beneath. This tuft was not observable in males of *wet-season* form that we examined.

Expanse, ♂ $2\frac{2}{10}$, ♀ $2\frac{6}{10}$ inches.

CATERPILLAR.—“Resembles that of *R. Hordonia* in form, but the head is bifid at the top, and the dorsal points are wanting, while the last segment is produced into a single blunt point. The colour is dark greenish-brown, the fore-part, as in *R. Hordonia*, being much darker than the rest, but bordered with pale grey” (Davidson and Aitken, *l.c.* 251).

CHRYSLIS.—“Like that of *R. Hordonia*, but rather broader, and the wing-cases more evenly expanded” (*id.* 251).

HABITAT.—Sikkim; Bhotan; E. Bengal; Orissa; S. India; Burma; Upper Tenasserim.

DISTRIBUTION.—This is a rare species. Mr. de Nicéville “took a single female in the Sikkim Terai in October, and Mr. Otto Möller has one specimen also from Sikkim, taken in May. The Indian Museum, Calcutta, has examples from Buxa, Bhotan, a male taken by Mr. W. C. Taylor in Orissa, in March, another from the Wynaad, S. India, taken by Mr. Rhodes-Morgan, and a third from Cannanore. Major Marshall has a single female, taken in the Thoungyeen forests, Upper Tenasserim, in March. The four latter specimens differing from Himalayan females in having the submarginal band on upperside of hindwing nearly as broad as the discal band” (Butt. Ind. ii. 86). “Very rare in Sikkim, occurs in the Terai and low Valleys, probably throughout the summer” (*id.* Sikkim Gaz. 1894, 136). Colonel C. Swinhoe has examples of both sexes from Kavar, S. India, and from Shillong, Khasia Hills. Mr. G. F. Hampson records “one specimen taken on the Western Slopes of the Nilgiris at 500 feet, in October” (J. A. S. Beng. 1888, 352). Mr. H. S. Ferguson found it “rare in Travancore, two specimens being taken near Trevandrum in July” (J. Bombay N. H. Soc. 1891, 8). Capt. E. Y. Watson took “two specimens at Kathlekan, Mysore, in November” (*id.* 1890, 4). According to Messrs. Davidson and Aitken, it is not very common in the N. Kanara District, Bombay, but appears to be generally distributed” (*id.* 1896, 251). Col. C. H. E. Adamson records it as very uncommon at Bhamo, Upper Burma (List, 1897, 20). Capt. E. Y. Watson obtained three specimens at Tilin, in March and April, during the Chin-Lushai Expedition of 1889-90 (J. Bombay N. H. S. 1891, 38). A male from Naga Hills, and a female of the dry-season brood, from Atarum, Upper Tenasserim, taken by Capt. C. T. Bingham in March, is in Mr. W. Rothschild’s collection.

HABITS AND FOOD-PLANT OF LARVA.—“The larva of *Viraja* was discovered by Mr. T. R. Bell, in the Kanara District of Bombay. It feeds on the Blackwood tree, *Dalbergia latifolia*, and also on *D. racemosa*, and has similar habits to that of *R. Hordonia*, cutting through a leaf-stalk in such a way that all the leaflets beyond the cut part hang over; then it cuts off each leaflet of the pendant part, joins it to the stem with silk, and lives in the house of dead leaves thus formed, *feeding on the dead leaves*” (Davidson and Aitken, J. Bombay Nat. Hist. Soc. 1896, 251, 351).

NOTE.—This species, *S. Viraja*, is probably mimicked by the females of *Pantaporia Inara* and of *P. Selenophora*.

STABROBATES MIAH.

Neptis Miah, Moore, Catal. Lep. Mus. E. Ind. Company, i. p. 164, pl. 4a, fig. 1, ♂ (1857); Proc. Zool. Soc. 1858, p. 4. de Nicéville, Butt of India, etc., ii. p. 85 (1886).

Wet-season brood (Plate 299, fig. 1, 1a, b, ♂ ♀).

IMAGO.—Male. Upperside dark purpurescent-black; markings deep yellowish-ochreous; cilia slightly alternated with greyish-white. *Forewing* with an elongated discoidal streak extending along lower half of the cell and ending in a more or less obtuse point half-way along the upper median veinlet, its upper edge indented at end of cell; a transverse curved discal almost complete macular band, composed of outwardly-oblique subapical, discal, and lower spots, the subapical being joined to the discal by a slender more or less complete streak, and the discal joined to the lower spot; followed by a submarginal slender pale greyish-brown or ochreous-brown line. *Hindwing* crossed by a moderately broad inner-discal band and a narrow outer band, between which is a slightly-defined pale greyish-brown fascia, and beyond by a similar submarginal line; on the costa is a broad basal glossy brownish-grey patch. Underside deep purplish-red; markings, as above, pinkish-white, the cell-streak and discal band of forewing having their edges inwardly suffused with ochreous. *Forewing* also with the submarginal line and an inner sinuous line purplish-grey. *Hindwing* also with a short basal fascia, a less-defined subbasal fascia radiating along base of the veins, a medial discal sinuous band, inner edges of the outer-discal band, and the submarginal line, all being purplish-grey.

Female. Upperside as in male, with the markings somewhat broader and paler. Underside as in the male. *Body* and palpi above black; palpi and thorax beneath, and forelegs greyish; abdomen beneath and hind-legs pale greyish-ochreous; antennæ black.

Expanse, ♂ 2 to $2\frac{2}{10}$, ♀ $2\frac{4}{10}$ inches.

Dry-season brood (Plate 299, fig. 1, c, d, e, ♂ ♀).

Male and female. Upperside with the discoidal streak and discal bands somewhat broader than in wet-season form; the submarginal line more distinctly ochreous.

Expanse, ♂ $2\frac{2}{10}$, ♀ $2\frac{4}{10}$ inches.

HABITAT.—Sikkim; Bhotan; Assam; Khasia and Naga Hills.

DISTRIBUTION.—“This is a fairly common species in Sikkim throughout the summer, and I have taken numerous males in October, sucking up the moisture from damp sand in the beds of streams. Mr. J. L. Sherwill took a male at Hulunguri in the Jorehat District, Assam, in March” (de Nicéville, *l.c.* 95). “Not uncommon in Sikkim by the river sides at from 1000 to 3000 feet elevation, from April to October” (H. J. Elwes, *Tr. Ent. Soc.* 1888, 343). Colonel C. Swinhoe

records it as "very common in the Khasia Hills" (Tr. Ent. Soc. 1893, 279). A specimen from the Naga Hills is in Mr. W. Rothschild's collection.

STABROBATES NOLANA.

Neptis Nolana, Druce, Proc. Zool. Soc. 1874, p. 105, ♀.

Dry-season brood (Plate 298, fig. 2, 2a, ♂ ♀).

Male and female. Upperside purpurescent-black; markings deep yellowish-ochreous. *Forewing* with the discoidal streak comparatively broader than in *Miah*, the subapical and lower discal band much broader, the upper part of the latter portion larger and more quadrately-angular, the slender marginal line distinctly ochreous. *Hindwing* with much broader discal and outer band, outer marginal line distinctly ochreous. Underside dull deep chestnut-red; markings broad as above; cell-streak and discal band on forewing virescent-white, slightly washed with pale ochreous in male and more so in female; bands on hindwing virescent-white, the medial discal fascia, outer marginal line and basal streak bluish-grey.

Expanse, ♂ $1\frac{8}{10}$, ♀ 2 inches.

Wet-season brood.

Upperside; ground-colour blacker; bands deeper yellowish-ochreous, somewhat narrower, but still broader than in *Miah*; marginal line less defined. Underside; ground-colour rich purpurescent chestnut-red; markings narrower, as above, the bands sharper defined and more deeply coloured.

Expanse, ♂ $1\frac{8}{10}$ inch.

HABITAT.—Burma; Siam; Malay Peninsula.

DISTRIBUTION.—The type specimen, now in the British Museum, is recorded from Chentaboon, Siam. Specimens of the dry and wet-season form from Tilin Yaw taken in March, October, and November by Capt. E. Y. Watson, and a male from Thoungyeen, Burma, are also in the British Museum. A male from Muong Gnow, Shan States, Burma, is in Mr. W. Rothschild's collection; a single specimen was taken by Col. C. H. E. Adamson at Tounggya, Sekkan, Tenasserim, in February (List, 1897, p. 20).

Of our illustrations on Plate 298, fig. 2 is from a Burmese male, and fig. 2a from the type female of the dry-season form.

MALAYAN AND CHINESE SPECIES.—*Stabrobates Batara* (*Neptis Batara*, Moore, Trans. Ent. Soc. 1881, p. 310. N. *Miah*, Distant, Rhop. Malay. p. 444, pl. 41, fig. 14, ♂. *Habitat.* Malay Peninsula, Sumatra.—*Stabrobates Javanica*. Nearest

to *Batara*. Male. Wings somewhat shorter. *Forewing* with broader discoidal streak and discal band, the lower end of the discoidal streak extending slightly below the upper median, its end also less prolonged, the subapical and lower portions of the discal band slightly joined; a submarginal very slender ochreous line. *Hindwing* with a broader inner-discal band and narrower outer band, both also broader than in *Batara*. Underside; ground-colour rich ochreous-brown; the discoidal streak, and discal bands, as above, broader than in *Batara*, all being yellowish-ochreous; the submarginal band on both wings, and the slender sinuous medial-discal line on the hindwing being slightly washed with violet-grey. Expanse, ♂ $1\frac{8}{10}$ inch. Type in Coll. Hewitson, Brit. Mus. *Habitat.* Java.—*Stabrobates Disopa* (Neptis Disopa, Swinhoe, Ann. Nat. Hist. 1893, p. 256. *Syn.* N. Miah, Leech, Butt. of China, p. 198, pl. 19, fig. 3 (1893). *Habitat.* W. China.—*Stabrobates Chinensis* (Neptis Chinensis, Leech, Butt. of China, p. 198, pl. 19, fig. 2 (1893). *Habitat.* W. China.—*Stabrobates Thestias* (N. Thestias, Leech, *l.c.* p. 196, pl. 18, fig. 3, ♂ (1893). *Habitat.* W. China.—*Stabrobates Aspasia* (N. Aspasia, Leech, Entom. 1890, p. 37; Butt. of China, p. 193, pl. 18, fig. 5, ♂). *Habitat.* W. China.—*Stabrobates Antigone* (N. Antigone, Leech, *l.c.* p. 192, pl. 18, fig. 6, ♀. *Habitat.* W. China.—*Stabrobates Arachne* (N. Arachne, Leech, *l.c.* p. 191, pl. 18, fig. 7, ♂. *Syn.* N. Giddeneme, Oberthür, Et. Ent. 1891, p. 9, pl. 1, fig. 7. *Habitat.* W. China.—*Stabrobates Thetis* (N. Thetis, Leech, *l.c.* p. 191, pl. 18, fig. 10, ♂. *Habitat.* W. China.—*Stabrobates Armandia* (N. Armandia, Oberthür, Etud. Ent. 1876, p. 23, pl. 4, fig. 4, a, ♂. Leech, *l.c.* p. 195. *Habitat.* W.C. China.—*Stabrobates Themis* (N. Themis, Leech, *l.c.* p. 191, pl. 18, fig. 8, ♀). *Habitat.* W.C. China.—*Stabrobates Thisbe* (N. Thisbe, Ménetr. Schrenck's Reis. Amur. ii. p. 26, pl. 2, fig. 9 (1859). *Habitat.* Amurland.—*Stabrobates Beroe* (N. Beroe, Leech, *l.c.* p. 193, pl. 18, fig. 9, ♂. *Habitat.* C. China.—*Stabrobates Hesione* (N. Hesione, Leech, *l.c.* p. 194, pl. 18, fig. 1. *Habitat.* W.C. China.—*Stabrobates Antilope* (N. Antilope, Leech, *l.c.* p. 197, pl. 18, fig. 2, ♂. *Habitat.* W.C. China.—*Stabrobates Cydippe* (N. Cydippe, Leech, *l.c.* p. 196, pl. 18, fig. 4, ♂. *Habitat.* W. China.

PHILIPPINE ALLIED GENUS.—GENUS TAGATSIA.—Wings small. *Forewing* narrow, subtriangular; first subcostal branch emitted at one-eighth before end of the cell, second at one-fourth beyond the end of the cell; the cell open. *Hindwing* rather short, conically-ovate; exterior margin obliquely convex, even, anal angle rounded; precostal vein short, slightly bent outward; second subcostal and radial at equal distances from the costal. *Body* moderately slender; palpi shorter than in *Rahinda*, apical joint also shorter and stouter; eyes naked. *Type.* T. Dama.—*Tagatsia Dama* (Athyma Dama, Moore, P. Z. S. 1858, p. 19, pl. 51, fig. 5). Neptis Dama, Semper, Reis. Phil. Lep. p. 152, pl. 30, fig. 17, 18, ♂ ♀ (1889). *Habitat.* Manilla; Luzon.—*Tagatsia Cyrilla* (Neptis

Cyrrilla, Felder, Wien. Ent. Mon. 1863, p. 114. Semper, *l.c.* p. 152, pl. 30, fig. 7, 8, ♂ ♀ (1889). *Syn.* *N. fervescens*, Butler, Tr. Ent. Soc. 1874, p. 427. *Habitat.* Luzon.—*Tagatsia Vidua* (Neptis Vidua, Staudinger, D. Ent. Zeit. 1889, p. 64. *Habitat.* Palawan.—*Tagatsia Athenais* (Neptis Athenais, Felder, Wien. Ent. Mon. 1863, p. 115. Semper, *l.c.* p. 152, pl. 30, fig. 9, 10, ♂ ♀ (1889). *Habitat.* Mindanao.—*Tagatsia Mysia* (Neptis Mysia, Feld. Wien. Ent. Mon. 1860, p. 247. *Habitat.* Batchian.—*Tagatsia Phrygia* (Neptis Phrygia, Feld. W. Ent. Mon. 1863, p. 115). *Habitat.* Mindoro.—*Tagatsia Attica* (Neptis Attica, Semper, Reis. Phil. Lep. p. 143, pl. 30, fig. 11, 12, ♂ ♀ (1889). *Habitat.* Mindanao.—*Tagatsia Athene* (Neptis Athene, Staudinger, D. Ent. Zeit. 1889, p. 62. Semper, *l.c.* p. 153, pl. 30, fig. 13, 14, ♂ ♀. *Habitat.* Palawan; Phil. Isles.

Genus RAHINDA.

Rahinda, Moore, Lep. of Ceylon, i. p. 56 (1881).

Pantoporia (part), Hübner, Verz, Schmett. p. 44 (1816).

Neptis (part), Auctorum.

Neptis (sect. 7, part), Felder, Neues Lep. p. 31 (1861).

IMAGO.—Male. Wing small. *Forewing* subtriangular, rather narrow, apex obtusely pointed, exterior margin slightly convex and slightly scalloped; posterior margin long, much recurved; first subcostal branch emitted at one-fifth before end of the cell; second at about one-fourth beyond end of the cell; discocellulars both short, outwardly oblique, second slightly concave; cell open; base of posterior margin of the underside broadly glossy silvery-grey, and enclosing an elongated patch of brown glandular scales above the submedian vein. *Hindwing* rather narrow, somewhat elongate, ovate; anterior margin arched in the middle, apex rounded, exterior margin very oblique and convex, slightly scalloped; precostal vein short, slightly bent outward at tip; subcostal branch and radial emitted at some distance equally apart from the costal; costal vein ending at about one-third before the apex; with a broad glossy silvery-grey costal border, extending in the *dry-season* form to below the second subcostal, and isolating a conspicuous unglossed elongate (? glandular) patch of brown scales situated between the bases of subcostals; this patch, in the *wet-season* form pervading the interspace below the second subcostal veinlet. *Body* slender; palpi rather slender, laxly clothed with fine hairs, third joint long; antennæ slender, with a rather stout club; eyes naked. *Type.* *R. Hordonia*.

CATERPILLAR.—Head bifid at vertex. *Body* armed with two subdorsal forward-directed fleshy-pointed spines on the third and fourth segments and two hindward-directed similar spines on the sixth and twelfth segments.

CHRYsalis.—Head-piece obtusely pointed in front, thorax rounded, anterio-dorsum arched.

HABITS OF IMAGO.—Under reference to *R. Hordonia*, Mr. J. Beetham (Journ. Bombay N. H. Soc. 1890, 280) says, "The flight of the butterflies of this genus is peculiar. They seem to float and sail along, so that when on a level with the eye they disappear and re-appear; when settled on leaves as is their habit, they rest with wide expanded wings."

HABITS AND FOOD-PLANTS OF LARVA.—According to the observations made by Mr. J. Davidson and E. H. Aitken in the N. Kanara District, Bombay, "The larva may be found on several species of *Acacia*, and has the curious habit of feeding by preference, not on green leaves, but on those which it has caused to wither. The trees on which it feeds have all bi-pinnate leaves with minute leaflets. It bites through one or two pinnæ, which immediately droop and dry up, but are kept from falling by a few threads of silk with which the larva has taken the precaution to attach them to the central leaf-stalk. Thenceforth it lives among them and feeds entirely on them. The fore and underparts of the larva is of a dark greenish-brown, the rest is just that shade of greenish-grey which the leaves assume when withered, and is crossed by diagonal dark bands exactly representing the spaces between the leaflets—a most perfect disguise."

RAHINDA HORDONIA.

Papilio Hordonia, Stoll, Cramer's Pap. Exot. v. pl. 33, fig. 4, 4, D. (1791)—*Wet-season*.

Nymphalis Hordonia, Godart, Encycl. Méth. ix. p. 429 (1823).

Neptis Hordonia, Westwood, Doubleday and Hewitson, D. Lep. p. 271 (1851). Moore, Catal. Lep.

Mus. E. I. Company, i. p. 164 (1857); Proc. Zool. Soc. 1858, p. 4. Distant, Rhop. Malayana, p. 150, pl. 17, fig. 13, ♂ (1883). de Nicéville, Butt. of India, etc., ii. p. 78 (1886).

Neptis plagiosa, Moore, Proc. Zool. Soc. 1878, p. 830—*Dry-season*.

Wet-season brood (Plate 300, fig. 1, larva and pupa; 1a, b, c, ♂ ♀).

IMAGO.—Male. Upperside rich dark olivescence reddish-brown; cilia slightly alternated with white. *Forewing* with a reddish-ochreous discoidal streak occupying the lower half of the cell and extending broadly beyond it to middle of the disc above and below the upper median veinlet, being also distinctly indented above opposite the discocellulars and less so at a short distance inward; a transverse discal excurved broken band composed of a sinuously formed subapical portion and a more regular lower portion; followed by an inner submarginal obscure grey undulated line, a more or less-defined darker orange-red slender middle submarginal line, and then by an outer marginal obscure grey line. *Hindwing* with a reddish-ochreous broad inner-discal band, its outer edge curving upward towards the costa,

and a very narrow outer-discal curved band, followed by a submarginal very obscurely defined greyish-bordered black line; costal border glossy silvery-grey, with an elongated dull grey subcostal patch of unglossed brown scales below it. Underside mottled with dark chestnut-red, and more or less profusely studded with violaceous-grey strigæ between the markings; the discoidal streak, and discal bands on both wings, as on upperside, being yellowish-ochreous, but with much less defined edges; the two submarginal lines on forewing are more lunular, both being yellow anteriorly and violaceous-grey posteriorly; the submarginal lines on hindwing also violaceous-grey; the grey strigæ between the discal bands on the hindwing form a more or less well-defined sinuous fascia; posterior border of forewing basally glossy silvery-grey, enclosing an elongate patch of brown scales above the submedian vein.

Female. Upperside. Markings as in male, but somewhat broader; the submarginal red line more distinct, the discoidal streak extending slightly but obscurely below the median vein. Underside as in the male. *Body* and palpi above dark olivescence-brown, middle of thorax iridescent golden-green; tegulæ and abdomen densely speckled with reddish-ochreous scales in the male, less speckled in the female; palpi and thorax beneath, forelegs and hind femora pale-greyish; abdomen beneath, middle and hind tibiæ and tarsi pale-ochreous; antennæ above black, beneath greyish, tip of club ochreous-red.

Expanse, ♂ $1\frac{6}{10}$ to $2\frac{2}{10}$, ♀ $1\frac{1}{10}$ to 2 inches.

Dry-season brood (Plate 300, fig. 1, d, e, f, ♂ ♀).

Male and female. Upperside with the reddish-ochreous markings broader than in *wet-season* brood, the cell-streak extending below the median vein; both the submarginal and the outer line on forewing generally reddish-ochreous, and on the hindwing, both these lines are also generally more or less obscurely of the same colour; in the male the subcostal patch of brown scales isolated between the bases of the subcostal veinlets. Underside as in *wet-season*, the markings, as above, less defined, those on the forewing being partially sprinkled and those on the hindwing sprinkled throughout, with reddish-ochreous strigæ, the violaceous-grey strigæ being disposed similarly but generally more dense than in *wet-season* examples; the glossy posterior border and its patch of brown scales on forewing of male, prominent.

Expanse, ♂ $1\frac{6}{10}$ to $1\frac{8}{10}$, ♀ $1\frac{8}{10}$ to 2 inches.

CATERPILLAR.—Head furcate; third, fourth, sixth, and twelfth segments each armed with two subdorsal long spine-like processes. Colour above greenish-grey, underparts greenish-brown, divided by a sublateral pale streak extending from anal segment to spine on fourth segment; a dorsal diagonal brown band on eighth to eleventh segment.

CHRYsalis.—Greenish-grey; thorax and antero-dorsum slightly arched; head-piece obtusely pointed in front. (Described from Davidson's figures.)

HABITAT.—W. and E. Himalayas; Continental India; Assam; Silhet; Burma; Tenasserim; Siam; Malay Peninsula, etc.

DRY-SEASON VARIETY.—Occasionally a variety of the male of the dry-season form occurs in which the markings of the upperside are much paler yellowish-ochreous, the discoidal streak and discal bands on both wings are very broad and less defined, the lower end of the discoidal streak being confluent between the medians with the lower discal band; in one example the subapical band covers the entire apex and is also confluent with the lower band; the intervening ground-colour is thus much restricted and is of an obscure brownish-black. On the underside the ground-colour is much paler, the bands and strigæ indistinctly defined. An example of this variety, from Maungbhoom, Bengal, is in our possession; one from Ooty, Nilgiris, in Colonel Swinhoe's collection, and one from Sikkim, taken in March, by Otto Möller, in Mr. W. Rothschild's collection.

DISTRIBUTION.—Mr. W. Doherty records taking it in Kumaon, at Ranibagh, the Terai, and the Ramganga, Kali, and Gorra Valleys; common at from 1000 to 4000 feet elevation (J. A. Soc. Bengal, 1886, 125). We possess specimens of the wet-season form from Sikkim and Bhotan, taken by Mr. G. C. Dudgeon, and of the dry-season form, males from Nepal, taken by the late General G. Ramsay; Sikkim, taken in March, a male variety from Maungbhoom, Bengal, a female from Calcutta, both sexes from Kanara, Malabar, and from the Nilgiris, also from Moulmain, Tounghoo, Burma, and a female from Yemma Choung, taken in February by Colonel C. H. E. Adamson. Mr. L. de Nicéville records the wet-season form from N.E. and S. India, and the dry-season form from Sikkim, Assam, Silhet, Malda, Orissa, Gangam, Nilgiris and Trevandrum, also from Chittagong and Upper Tenasserim. The dry form (*plagiosa*) taken in Sikkim in December, and typical *Hordonia* and intermediate forms from the spring to the autumn; typical *plagiosa* taken in Calcutta in February only; in Orissa, Mr. W. C. Taylor has taken *plagiosa* in February and March, and Mr. J. L. Sherwill in the Jorehat District, Assam, in March" (Butt. Ind. 79). "In Sikkim, it is a common species throughout the year, at low elevations. It is seasonally dimorphic, true *Hordonia* being the rains form, *plagiosa* occurring in the dry-season" (de Nicéville, Sikkim Gaz. 1894, 136). Lieut. E. Y. Watson, during the Chin-Lushai Expedition, obtained typical *Hordonia* at Pauk from September to December, and single specimens in February and March. Specimens transitional to *plagiosa* at Pauk and Tilin in November, and at Tilin from December to April. *Plagiosa* being taken at Tilin in March and April, and a single specimen in January" (J. Bombay N. H. S. 1891, 37). The type specimens of *plagiosa* were



1



1^a



2



2^a



3



3^a



4



4^a



1



1a



1b



1c



1d



1e



1.



1^b



1^a



1^c



1^e



1^g



1^d



1^f





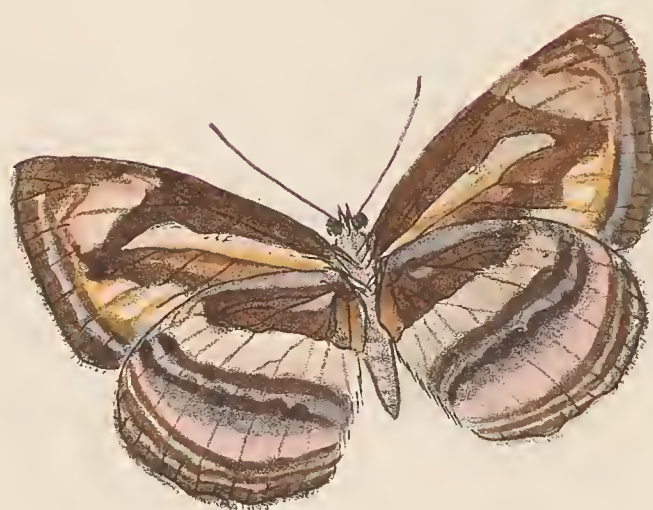
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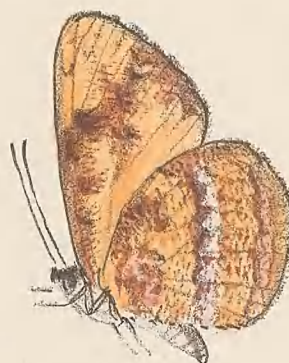
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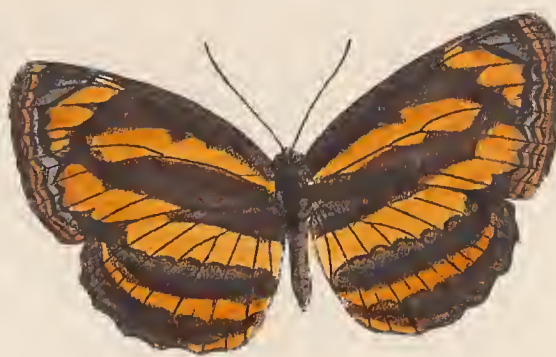
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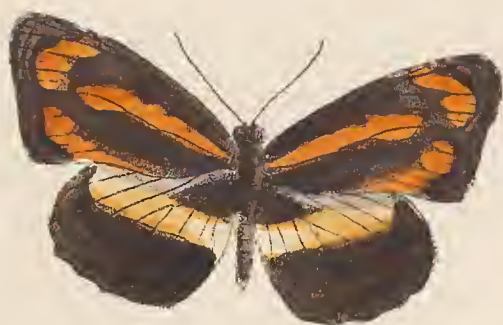
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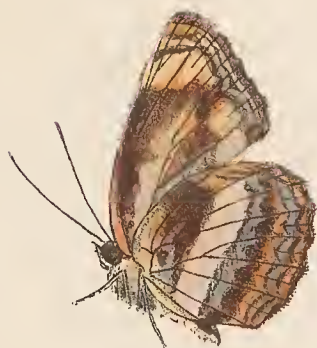
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2.



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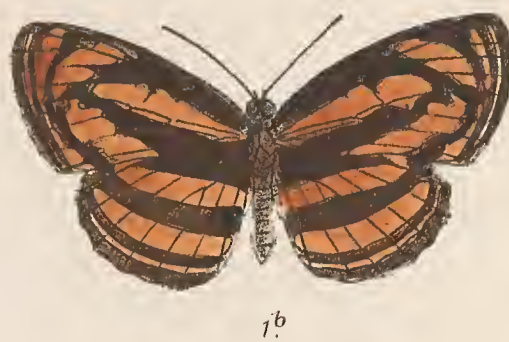
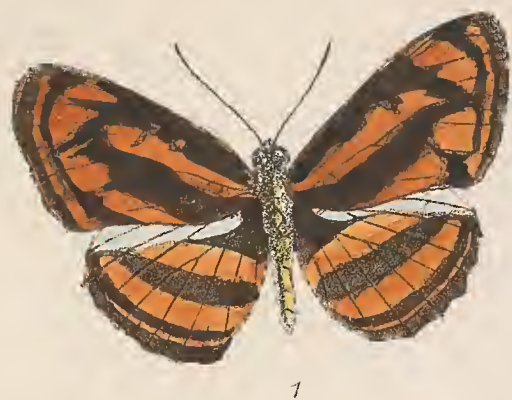
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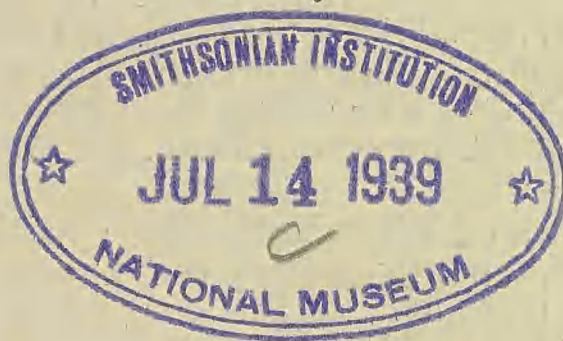
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taken in the cold weather on the road from Naththoung to Paboga in Upper Tenasserim. Dr. J. Anderson took it in Mergui in December. Colonel C. H. E. Adamson records it as "very abundant throughout Burma during the rainy and dry seasons" (List, 1897, p. 19). Mr. H. Druce records it from "Chentaboon, Siam" (P. Z. S. 1874, 105). "In the N. Kanara District, Bombay, this species is very common in all the more open wooded or scrubby parts during the latter half of the rainy season and throughout the dry months. During June and July it is rarely seen. The larva may be found on several species of *Acacia*, and has the curious habit of feeding by preference, not on green leaves, but on those which it has caused to wither" (J. Davidson, J. Bombay N. H. S. 1896, 250). Mr. H. S. Ferguson records it from "Travancore, the wet-season form being much commoner than the dry-season" (J. Bombay N. H. S. 1891, 8). Lieut. E. Y. Watson took it at "Kathlekan, Mysore, in November and December" (*id.* 1890, 4). It also occurs in the Malay Peninsula; Sumatra; Java; Borneo.

RAHINDA SINUATA (Pate 301, fig. 1, 1a, ♂ ♀).

Neptis Sinuata, Moore, Proc. Zool. Soc. 1879, p. 136. de Nicéville, Butt. of India, etc., ii. p. 79 (1886).

Rahinda Sinuata, Moore, Lep. of Ceylon, i. p. 56, pl. 28, fig. 3, 3a (1881).

IMAGO.—Male and female. Upperside. Differs from typical *Hordonia* in the discoidal streak being more irregularly bordered, both portions of the discal band narrower and very sinuously edged, the marginal red lines prominent. On the hindwing the lower edge of the discal band is distinctly sinuous, and the narrow outer band is also sinuous edged. Underside similarly marked as in *Hordonia*, the strigæ being less prominent and disposed in more irregular patches.

Expanse, ♂ $1\frac{6}{10}$ to $1\frac{8}{10}$, ♀ $1\frac{8}{10}$ to 2 inches.

HABITAT.—Ceylon.

DISTRIBUTION.—"Principally a low country insect, difficult to capture perfect as it always frequents the vicinity of thick thorny *Acacias*. Found at all times, but mostly in March and April" (Mackwood). "Found in the Western and Central Province; commonest in the Plains, but found up to 300 feet in forest land, at all times. Habits shy, flutters about bushes, alighting on the leaves with wings expanded" (Hutchison).

RAHINDA CNACALIS.

Neptis Cnacalis, Hewitson, Ann. and Mag. Nat. Hist. 1874, p. 357. de Nicéville, Butt. of India, etc., ii. p. 78 (1886).

Wet-season brood (Plate 301, fig. 2, 2a, b, c, ♂ ♀).

IMAGO.—Male and female. Upperside rich dark olivaceous reddish-brown; cilia
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alternated with white. *Forewing* with a moderately narrow reddish-ochreous discoidal streak extending along lower half of the cell to the middle of the disc above and below the upper median veinlet, being distinctly indented opposite the discocellular and less so at a short distance inward; a discal transverse moderately narrow excurved interrupted macular band, followed by a slender submarginal black-bordered violet-grey line which is undulated in the male and sinuous in the female, and by an outer marginal less-defined straighter line. *Hindwing* crossed by a prominent broad whitish inner-discal band, which is more or less tinged with ochreous, and a very obscurely-defined trace of a slender reddish-brown outer-discal line, which is more apparent in the female, followed by an obscure submarginal greyish-bordered black line. Underside mottled with very dark chestnut-red, more densely and somewhat blackish in the female; cell-streak and discal band on forewing, and the discal band on hindwing, as above, being very pale yellowish-ochreous and sometimes tinged with violaceous-white, the marginal lines of both wings and a sinuous fascia outwardly bordering the discal band on hindwing mottled with violet-grey. *Body* and palpi above blackish; tegulæ and abdomen slightly speckled with orange-yellow scales; palpi and thorax beneath, forelegs, middle and hind femora grey; abdomen beneath, middle and hind tibiæ and tarsi pale ochreous; antennæ black, tip reddish.

Expanse, ♂ $1\frac{4}{10}$ to $1\frac{8}{10}$, ♀ 2 inches.

Dry-season brood (Plate 301, fig. 2, d, e, ♂ ♀).

Male and female. Upperside similar to *wet-season* brood, except that on the forewing the reddish-ochreous cell-streak and discal band is somewhat broader, and with a distinct red line intervening between the two grey marginal lines; on the hindwing the inner-discal white band is somewhat broader and its outer edge sinuous, the outer-discal slender band being prominent, red, and sinuous. Underside similar to *wet-season* brood, but somewhat more mottled.

Expanse, ♂ $1\frac{6}{10}$ to $1\frac{8}{10}$, ♀ 2 inches.

HABITAT.—South Andamans.

DISTRIBUTION.—Confined to the Andaman Isles. Mr. F. de Roëpstorff obtained numerous specimens at Port Blair.

RAHINDA AURELIA (Plate 302, fig. 1, 1a, b, c, ♂ ♀).

Neptis aurelia, Staudinger, Exot. Schmett. p. 145 (1886).

Neptis (Rahinda) aurelia, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1895, p. 24, pl. S. fig. 15, ♀.

IMAGO.—“Female. Upperside black, with deep tawny markings. *Forewing* with

the discoidal band broad, extending well below the median vein, the end of the cell anteriorly indicated by a prominent short black bar; the discal band broad, in two portions, the anterior has its outer edge even and regularly curved, its inner edge is very irregular; the veins entering the edge from that side being defined with black, and almost dividing the band into three portions; the lower discal portion of the band consists of two parts, the anterior portion is rounded, with a short narrow anterior projection, the posterior is elongated and reaches the inner margin inwardly obliquely; a broad nearly even submarginal line slightly disconnected where it is crossed by the upper median veinlet; a greatly disconnected series of indistinct marginal spots. *Hindwing* with a recurved discal band from the costa to the abdominal margin; the submarginal band very broad, broader than the discal, interiorly attenuated and not quite reaching the costa, posteriorly ending on the abdominal margin; a narrow rather indistinct marginal line. Underside. *Forewing* with the ground-colour and markings much paler than in upperside, some of the latter almost white in the middle; a narrow subcostal yellow streak; the discoidal band as above; the discal band everywhere entirely crossed by the black veins; between this and the submarginal band there is a narrow yellow line which becomes obsolete at about the middle of the wing; the marginal lines as above. *Hindwing* with the ground-colour even paler than in forewing, glossed throughout with pale shining violet; the bands as above but very pale, almost whitish; with an additional macular pale band in the middle of the wing between the discal and submarginal bands; in the discoidal cell towards its base are two prominent round dark dots, the inner one almost touching the subcostal vein, the outer one quite touching the second subcostal veinlet; anterior to the last-named dot is an irregular dark bar, which commences on the second subcostal veinlet, and ends on the costal vein."

Male. Upperside; markings as in female, except that the marginal line on both wings is less distinct, and the hindwing has a prominent broad satiny-white costal border extending to below the second subcostal veinlet. Underside as in female.

Expanse, ♂ $1\frac{5}{10}$, ♀ $1\frac{8}{10}$ to $1\frac{9}{10}$ inch.

HABITAT.—Khasia Hills; Burma; Tenasserim; Malay Peninsula; Borneo.

DISTRIBUTION.—"Described by Mr. de Nicéville from three females in his own collection from the Donat Range, Middle Tenasserim, and one male in Capt. E. Y. Watson's collection, captured in the Karen Hills in December" (l.c. 26). A male from Sumatra (Wallace) in the Hewitsonian collection, and also a male and female from Borneo, the female with markings above and below agreeing exactly with above description and figure, and a female from Malacca are in the British Museum. Staudinger's type is recorded from Malacca. A male and female from Kina Balu, North Borneo, and a female from Guong Ijan, Malay Peninsula, is in Mr. W. Rothschild's collection.

RAHINDA PARAKA.

Neptis Paraka, Butler, Trans. Linn. Soc. Zool. 2nd ser. i. p. 542, pl. 68, fig. 2, ♀ (June, 1879). de Nicéville, Butt. of India, etc., ii. p. 80 (1886).

Neptis Peraka, Distant, Rhop. Malayana, p. 150, pl. 17, fig. 2, ♀ (1883).

Neptis (Rahinda) Paraka, de Nicéville and Martin, Journ. As. Soc. Bengal, 1895, p. 407.

Neptis Dahana, Kheil, Rhop. Nias, p. 24, pl. 5, fig. 27 (1884).

Dry-season brood (Plate 302, fig. 2, 2a, b, ♂ ♀).

IMAGO.—Male. Upperside rich dark ochreous-brown, almost black; cilia greyish-brown. *Forewing* with a reddish-ochreous broad discoidal streak, which is indented at upper end of cell and extends irregularly below the median vein from the base; a contiguous subapical broad band, its outer edge evenly curved and its inner edge irregularly sinuous; a lower-discal oblique broad band, constricted in its middle, its upper portion somewhat rounded and pointed anteriorly inward—the point in some specimens touching the outer lower angle of the discoidal streak; beyond are two slender duller reddish-ochreous submarginal wavy lines, the first line angled inwards at the middle between the discal bands, followed by a less-defined similar outer marginal line. *Hindwing* with a broad reddish-ochreous inner-discal even-edged band, and a narrower outer-discal curved band, followed by a slender duller ochreous submarginal line; an obscure pale line also apparent between the two discal bands; subcostal patch of brown scales similarly disposed to that in *Hordonia*. Underside with the markings yellowish-ochreous and obscurely defined, the intervening ground-colour between the markings being obscure brownish-ochreous, the markings on the hindwing having slightly defined blackish-edges. *Forewing* also with the posterior base below the cell broadly glossy violet-grey and enclosing an elongated brown patch of ? glandular scales extending above and below the submedian. *Hindwing* also with the costal base slightly yellowish-ochreous, the slightly-defined darker interspace between it and the discal band being obscurely marked by a short inwardly-oblique blackish bar situated between the discal interspace of the costal and subcostal vein, also a similar outer bar below the subcostals.

Female. Upperside markings as in male, but somewhat narrower, and all with more sharply-defined edges. Underside with the markings somewhat more defined than in male, the intervening ground-colour being more dusky and greyish-ochreous. On the forewing is a very slightly defined blackish-speckled longitudinal bar within the upper basal area of the cell, followed by an outwardly-oblique shorter similar bar on the discocellular veinlets, and a longer oblique bar beyond. *Hindwing* also with the two subbasal short oblique bars more distinctly black than in the male, the lower one being continued brokenly to the abdominal margin. *Body* and palpi above ochreous-brown; tegulæ and abdomen speckled with ochreous scales, forming on the

latter a slight band; body and palpi beneath and legs pale greyish-ochreous, the middle and hind tibiæ and tarsi being very pale ochreous; antennæ black, tip reddish-ochreous.

Expanse, ♂ $1\frac{6}{10}$ to $1\frac{7}{10}$ ♀, $1\frac{8}{10}$ inch.

Wet-season brood (Plate 302, fig 2, c, d, ♀).

Male and female. Upperside with the discoidal streak and discal bands somewhat narrower, the three marginal lines on forewing distinct, and the marginal line on hindwing also very distinct. Underside with the ground-colour dusky ochreous-brown, the markings brighter yellowish-ochreous and more distinctly defined, those on the hindwing more prominently black-edged.

Expanse, ♂ $1\frac{6}{10}$ to $1\frac{7}{10}$, ♀ $1\frac{8}{10}$ inch.

HABITAT.—Assam; Silhet; Daffa Hills; Naga Hills; Burma; Tenasserim; Malay Peninsula, etc.

DISTRIBUTION.—Mr. de Nicéville records it from “Silhet and the Daffa Hills” (Butt. Ind. ii. 80). A specimen from the Naga Hills is in Mr. W. Rothschild’s collection. “Mr. H. M. Parish obtained it in the Chittagong District in October and November” (Butt. Ind. ii. 80.). Mr. de Nicéville also records it from Jorehat, Assam; Bassein, in Arakan; Bhamo, Upper Burma; Perak, Malay Peninsula; Nias; Sumatra; Java; and Borneo” (J. A. S. Bengal, 1895, 25). We possess examples from Mergui, Malacca, Sumatra, and Sarawak, Borneo. Col. C. H. E. Adamson records it as “common in Burma” (List, p. 19). Capt. E. Y. Watson obtained “three specimens in the Upper Chindwin Hills, in April and May” (J. Bombay N. H. S. 1897, 653). Dr. J. Anderson took it in “Mergui, in March” (J. Linn. Soc. Zool. 1886, 36). We have verified specimens from Nias Island, in the collection of Mr. W. Rothschild and of Mr. H. Grose-Smith, and from Malacca, Singapore, Sumatra, Borneo, in the British Museum.

RAHINDA ASSAMICA (Plate 303, fig. 1, 1a, ♂).

Rahinda Assamica, Moore, Trans. Ent. Soc. 1881, p. 311, ♂.

Neptis Assamica, de Nicéville, Butt. of India, etc., ii. p. 80 (1886).

IMAGO.—Male. Upperside dark ochreous-brown, almost black; cilia slightly alternated with grey. *Forewing* with a broad deep reddish-ochreous discoidal streak occupying the whole area of the cell and extending to middle of the disc; the discal interrupted band broad, the lower portion slightly constricted in the middle; followed by an obscure reddish slender submarginal line. *Hindwing* with a broad reddish-ochreous inner-discal band and outer-discal band, both being confluent between the

lower median and submedian vein, the abdominal margin also being reddish-ochreous; a submarginal slightly-defined reddish line. Underside with broader ochreous-yellow bands than on upperside, the very narrow costal, discal, and submarginal interspaces between the bands on forewing, and also between the basal broad area and the discal and submarginal bands on hindwing being obscure ochreous-brown. *Body* and palpi above blackish; tegulæ and abdomen slightly speckled with ochreous scales; palpi and thorax beneath, forelegs, middle and hind femora greyish; middle and hind tibiæ and tarsi, and abdomen beneath pale ochreous-yellow; antennæ black, tip reddish.

Expanse, ♂ $1\frac{7}{10}$ to $1\frac{8}{10}$ inch.

HABITAT.—Assam.

DISTRIBUTION.—Of this rare species, Mr. de Nicéville records “two males, one being the type, from Sibsagar, Upper Assam, taken by Mr. S. E. Peal, in the Indian Museum, Calcutta, and one in his own collection from Hulunguri, Jorehat District of Assam, taken by Mr. J. L. Sherwill, in March. One of the Sibsagar and the Jorehat specimen differ from the type in the extent of the red markings on the upperside; in the type specimen the oblique subapical and the lower-discal bands of the forewing are separated, and the discal black band on the hindwing is wide, while in the other two specimens the former are joined, and the latter is less than half as wide” (l.c. 80). A male, labelled “Siam,” is in Mr. H. Grose-Smith’s collection.

RAHINDA DINDINGA.

Neptis Dindinga, Butler, Trans. Linn. Soc. Zool. 2nd ser. i. p. 542, pl. 68, fig. 6 (June, 1879).

Distant, Rhop. Malayana, p. 151, pl. 17, fig. 5, ♀ (1883). de Nicéville, Butt. of India, etc., ii. p. 80 (1886).

Dry-season brood (Plate 303, fig. 2, 2a, b, c, ♂ ♀).

IMAGO.—Male and female. Upperside rich ochreous-brown; markings ochreous-yellow. *Forewing* with a broad discoidal streak, slightly indented at upper end of cell and obscurely extending slightly below the cell; subapical band broad and deeply cleft at the upper radial, its outer edge curved; lower-discal band broad, constricted in its middle, its outer upper edge rounded; two marginal slender greyish lines, the inner slightly dentate between the discal bands, and the outer slightly ochreous at its posterior end. *Hindwing* with a very broad inner-discal band, and a narrower outer-discal curved band, followed by a slender submarginal distinct ochreous-yellow line, which is somewhat sinuous in the female. Underside with the markings paler yellowish-ochreous and well-defined, but broader, the intervening ground-colour being ochreous-black; the two marginal lines on forewing greyish-ochreous; on the hindwing the marginal lines are ochreous; a distinct greyish-

ochreous lunular line extending medially along the dark interspace between the yellow discal bands, and the subbasal dark band has a slight outwardly projected angle between the costal and subcostal vein.

Wet-season brood (Plate 303, fig. 2, d, e, ♀).

Male and female. Upperside with the discoidal streak, and discal bands on both wings comparatively narrower, the marginal lines grey, the line on hindwing tinged with ochreous posteriorly. Underside with the markings narrower, as above, the ground-colour darker, otherwise as in *dry-season* brood.

Expanse, ♂ $1\frac{8}{10}$ to 2, ♀ 2 to $2\frac{1}{10}$ inches.

HABITAT.—Lower Burma; Tenasserim; Malay Peninsula; Borneo.

NOTE.—This species has similar markings on the upperside to *Dorelia* and *Sattanga*, but the bands are broader in both *dry* and *wet* forms. *Dindinga* may be easily distinguished from them by the submarginal lines on forewing being grey—whereas in the others the inner line is prominently ochreous. On the underside, the bands are also broader, the marginal lines on forewing being greyish, and on the hindwing the interspaces between the bands are prominently defined by black edging.

DISTRIBUTION.—A male, taken in the Ataran Valley, in March, and a female from the Houndraw Valley, Burma, taken in October, and a male from the Mepley Valley, Tenasserim, in January, by Capt. Bingham, and the type specimen from Malacca, are in the British Museum. A male from Borneo is in Mr. Grose-Smith's collection, and a female from Sandakan, N. Borneo, is in Colonel Swinhoe's collection.

CHINESE AND MALAYAN SPECIES.—*Rahinda Bieti* (Neptis Bieti, Oberthür, Etudes Ent. xix. p. 16, pl. 8, fig. 69 (1894). *Habitat.* W. China.—*Rahinda Rihodana* (Neptis Rihodana, Moore, P. Z. S. 1878, p. 698. *Habitat.* Hainan.—*Rahinda Sandaka*, Butler, Proc. Zool. Soc. 1892, p. 120. *Habitat.* N. Borneo.—*Rahinda Doronia* (Neptis Doronia, Staudinger, Deuts. Ent. Zeit. 1889, p. 59. *Habitat.* Palawan.—*Rahinda tricolor* (Neptis tricolor, Staudinger, *l.c.* 1889, p. 60. *Habitat.* Palawan.—*Rahinda Heliobole* (Neptis Heliobole, Semper, Reise Phil. Lep. p. 151, pl. 30, fig. 19, 20. *Habitat.* Mindanao. *Rahinda Epira* (Neptis Epira, Felder, Reise, Nov. Lep. pl. 56, fig. 9, 10. Semper, *l.c.* p. 151. *Habitat.* Luzon.

Genus LASIPPA.

Lasippa, Moore, Lep. Indica, iii. p. 146 (1898).

IMAGO.—Male. *Forewing* more triangular in shape than in typical *Rahinda*; the exterior margin being more oblique, and also even; first and second subcostal branches both emitted before end of the cell; base of posterior margin of the underside

broadly glossy greyish-white enclosing a very pale brown patch of scales above the submedian vein. *Hindwing* with the exterior margin more oblique, and even; both subcostal branches emitted together opposite the precostal vein; radial at some distance from base of the second subcostal; costal border, basally, broadly glossy greyish-white, extending to below base of the radial veinlet, and in the *dry-season* form, isolating an elongated unglossed brownish patch of scales between the bases of subcostals. *Body* slender; palpi slender, laxly clothed with fine hairs; antennal club slender.

TYPE.—*L. Heliodore* (Fabr.).

LASIPPA HELIODORE.

Papilio Heliodore, Fabricius, Ent. Syst. iii. i. p. 130 (1793). Jones, Icones, iv. pl. 76, fig. 2, ♂ (*dry form*).

Neptis Heliodore, Butler, Catal. Fabr. Lep. Brit. Mus. p. 62 (1869).

Neptis Tiga, Moore, Proc. Zool. Soc. 1858, p. 4. de Nicéville, Butt. of India, etc., ii. p. 82 (1886). Distant, Rhop. Malay. p. 151, pl. 17, fig. 4, ♂.

Neptis Dorelia, Butler, Trans. Linn. Soc. Zool. 1879, p. 542, pl. 67, fig. 3. Distant, *l.c.* p. 152, pl. 17, fig. 3 (*wet form*).

Dry-season brood (Plate 304, fig. 1, 1a, b, c, ♂ ♀).

IMAGO.—Male and female. Upperside rich ochreous-black; cilia greyish-brown. *Forewing* with a rich yellowish-ochreous discoidal streak which does not extend below the median vein, it is indented at the discocellulars by a slender ochreous-centred wedge-shaped mark; a subapical broad band somewhat irregularly edged on both sides, a lower-discal oblique broad band which is slightly constricted in its middle, and the upper portion sinuous outwardly; beyond is a prominent ochreous somewhat broad lunular submarginal line and a very slender less-defined dull ochreous marginal line. *Hindwing* with a yellowish-ochreous broad inner-discal band which widens anteriorly, and a narrow outer-discal curved band, followed by a slender dull ochreous submarginal line; costal border, basally, broadly, glossy greyish-white, extending to below base of the radial veinlet, and isolating an elongated unglossed brownish patch of scales between bases of the subcostals. Underside with pale dull yellowish-ochreous less-defined markings, as above, except that the discoidal streak extends very slightly below the cell, the intervening ground-colour being uniformly pale obscure ochreous-brown. *Hindwing* also with the costal base pale yellowish-ochreous well separated from the subbasal dark band by the costal vein; and in the male the subbasal dark band has a projecting outward angle between the subcostal veins. *Body* and palpi above black; tegulæ and band on base of abdomen ochreous; palpi and thorax beneath, forelegs, and hind femora pale-greyish; abdomen beneath and hind tibiæ and tarsi pale ochreous; antennæ black.

Expanse, ♂ $1\frac{8}{10}$, ♀ $1\frac{9}{10}$ inch.

Wet-season brood (Plate 304, fig. 1d, e, ♂ ♀).

Male and female. Upperside with somewhat deeper yellowish-ochreous markings, the discoidal streak and discal bands on both wings narrower than in *dry-season* brood, but the submarginal line on both wings is more distinct, and on the forewing the latter is somewhat broader and lunulated, the discoidal streak has a more distinctly-defined wedge-shaped ochreous-centred mark, which in some extends almost to the base of upper median veinlets, and the lower portion of the discal band is more constricted in the female. Underside with the markings, as above, yellowish-ochreous and broader, the discoidal streak extending below the cell, the intervening ground-colour being darker and more regularly defined than in the *dry-season* brood.

Expanse, ♂ $1\frac{6}{10}$ to $1\frac{7}{10}$, ♀ $1\frac{6}{10}$ to $1\frac{8}{10}$ inch.

HABITAT.—Lower Burma; Tenasserim; Siam; Malay Peninsula; Sumatra; Java; Borneo.

DISTRIBUTION.—The type specimen of *Heliodore*, in the Banksian cabinet at the British Museum, is recorded from Siam. A male of the *dry-season* form, from Shillong, Khasia Hills, is in Mr. P. Crowley's collection, and a female of the *wet-season* form, from Assam, in Mr. W. Rothschild's collection. We possess a *dry-season* female from Bayah Choung, Burma, taken in February by Col. C. H. E. Adamson, and both sexes from Mergui; a female from Meetan, Upper Tenasserim, is in the British Museum. Of the *wet-season* form we have a male from Mergui, a female from Malacca, and both sexes from Sumatra. Dr. J. Anderson obtained it in "Mergui, in November and December, Sullivan Island in January, and Elphinstone Island in February" (J. Linn. Soc. Zool. 1886, 36). In the British Museum are specimens from Malacca (*Dorelia*), and from Java (*Tiga*). Mr. W. Rothschild has examples from Java and Borneo.

LASIPPA KUHASA (Plate 304, fig. 2, 2a ♂).

Neptis Kuhasa, de Nicéville, Butt. of India, etc., ii. p. 84 (1886); Journ. Asiatic Soc. Bengal, 1886, p. 250, pl. xi. fig. 12, ♂; *id.* p. 356 (1886).

IMAGO.—"Male. Upperside black, with orange markings. *Forewing* with a broad discoidal streak bounded below by the median vein, obscurely separated from the large triangular spot beyond by two fine black lines; a broad subapical patch well separated from a rather less broad lower-discal patch, which reaches the inner margin, and is strongly constricted at the first median veinlet; a prominent submarginal somewhat lunate band, with a very obscure and fine pale marginal line. *Hindwing* with a broad straight even discal band, and a similar but narrower submarginal band about one-third the width; marginal line as on forewing.

Underside. Both wings with the ground-colour much paler, and the bands also paler, ochreous rather than orange. *Forewing* marked as above. *Hindwing* with an additional ochreous band at the base of the costal margin, the discal and submarginal bands broader, with the band of the ground-colour between them narrower, the outer margin broadly fuscous, bearing a prominent ochreous line.

“Female. Both wings slightly paler. *Hindwing* with the discal band narrower, the submarginal band wider than in male. Underside with the same differences as above.”

Expanse, ♂ $1\frac{9}{10}$, ♀ 2 inches.

HABITAT.—Cachar.

DISTRIBUTION.—“Mr. J. Wood-Mason took one male in July, and two females in August, at Irangmara in Cachar, now in the possession of the Indian Museum, Calcutta” (*l.c.* 84).

LASIPPA SATTANGA.

Rahinda Sattanga, Moore, Trans. Ent. Soc. 1881, p. 311, ♀.

Neptis Sattanga, de Nicéville, Butt. of India, etc., ii. p. 83 (1886).

Dry-season brood (Plate 305, fig. 1, 1a, ♂).

IMAGO.—Male and female. Upperside olivescient ochreous-black; markings yellowish-ochreous, paler than in *Heliodore*, and very sharply defined. *Forewing* with the discoidal streak entire and sharply defined along lower edge of cell, but with a very slightly-defined wedge-shaped ochreous-centred mark at upper end of the cell; subapical and lower-discal band irregularly-edged, the latter much constricted in its middle, and in some specimens of female connected only by scattered yellow scales; submarginal yellow line narrow, distinct, and slightly lunular; marginal line in male yellow, in female greyish and indistinct. *Hindwing* with a broad inner-discal band, and a much narrower outer-discal band; submarginal line very obscure and pale greyish, not ochreous as in *Heliodore*. Underside with paler ochreous-yellow, broader and less defined markings, the intervening ground-colour obscurely defined and of a pale ochreous-brown.

Wet-season brood (Plate 305, fig. 1, b, c, ♀).

Upperside; markings somewhat narrower than in *dry-season*, and narrower than in *wet-season Heliodore*. Underside with all the bands more distinctly defined, and their interspaces darker ochreous-black.

Expanse, ♂ $1\frac{4}{10}$ to $1\frac{6}{10}$, ♀ $1\frac{8}{10}$ to 2 inches.

HABITAT.—Upper Burma.

DISTRIBUTION.—Specimens from Burma, and of both sexes from Tilin Yaw, taken by Capt. E. Y. Watson during the Chin-Lushai Expedition of 1889-90, in January, February and March, and from Yedu Yaw, Burma, in November, are in the British Museum. We possess the type female, and other specimens, also from Burma.

LASIPPA CAMBOJA (Plate 305, fig. 2, 2a, ♂).

Neptis Camboja, Moore, Proc. Zool. Soc. 1879, p. 136, ♂.

IMAGO.—Male. Upperside. *Forewing* with a pale ferruginous-yellow broad discoidal streak, extending below the cell a broad oblique subapical band, and a broad constricted lower-discal band; also two slender indistinct ferruginous-yellow marginal lines. *Hindwing* with a broad ferruginous transverse discal and a narrow slightly curved submarginal band, also a single indistinct slender ferruginous marginal line. Underside pale yellowish-ferruginous; bands as above, but indistinctly defined.

Expanse, $1\frac{5}{10}$ inch.

HABITAT.—Cambodia.

The type specimen, taken by Mr. Mouhot, was in the late Mr. N. C. Tully's collection, and of which our illustrations represent the upper and underside.

MALAYAN ALLIED SPECIES.—*Lasippa Siaka* (*Neptis Siaka*, Moore, Trans. Ent. Soc. 1881, p. 311, ♀). Male and female. Upperside with sharply-defined reddish-ochreous markings, the discoidal streak completely divided across end of cell by a black bar, the outer portion being short and triangular; the transverse discal band divided into three portions, its middle portion being well and completely separated from the lower; submarginal ochreous line formed of separate lunules. *Hindwing* with a straight inner-discal band, and a much narrower straight outer-discal band, the submarginal line slender and indistinct. Underside with well defined dusky-black interspaces between the yellowish-ochreous markings, as above. Expanse ♂ $1\frac{6}{10}$, ♀ $1\frac{8}{10}$ inch. *Habitat*.—Sumatra; Nias; Borneo.

MALAYAN ALLIED GENERA.—Genus *BACALORA* (Moore, Lep. Ind. iii. p. 146 (1898).—Male. *Forewing* elongate, subtriangular; apex obtusely rounded, exterior margin oblique and slightly concave in the middle; first subcostal branch emitted at one-fifth, and second branch immediately before end of the cell. *Hindwing* broadly ovate; apex rounded, exterior margin very oblique and slightly scalloped, anal angle obtuse; precostal vein bent abruptly outward beyond the middle; second subcostal emitted very close to costal, radial at considerable distance beyond;

cell area broad. *Type.* *Bacalora Pata*.—*Bacalora Pata* (Neptis Pata, Moore, Proc. Zool. Soc. 1888, p. 4, pl. 49, fig. 1, ♂. Semper, Reis. Phil. pl. 30, fig. 6, ♀. *Syn.* N. Isabellina, Felder, Wien. Ent. Monats. 1863, p. 114. *Habitat.* Manilla; Luzon.—*Bacalora Semperi* (N. Isabellina, Semper, Reisen Phil. Lep. p. 151, pl. 30, fig. 4, 5 (*nec* Felder). *Habitat.* S. Mindanao.—*Bacalora Patalina* (N. Patalina, Staudinger (Semper, Reis. Phil. Lep. p. 347 (1892). *Habitat.* Mindoro.

Genus *ATHARIA* (Moore, Lep. Ind. iii. p. 146 (1898).—*Neptis* (sect. 7, part), Felder, Neues Lep. p. 31 (1861).—Male. *Forewing* elongate, rather narrow, subtriangular; costa arched at the base, apex very obtuse, exterior margin oblique, slightly convex and almost even, posterior margin recurved; first subcostal branch only emitted before end of the cell, second subcostal emitted at one-fourth beyond the cell; discocellulars outwardly-oblique; cell open. *Hindwing* rather elongate, anterior margin almost straight, apex obtuse, exterior margin obliquely-convex and almost even; precostal vein abruptly bent outward; costal vein ending at a short distance before the apex. *Body* slender; palpi more slender than in *Rahinda*, and comparatively less laxly hairy; eyes naked; antennæ slender. *TYPE.* A. consimilis.—*Atharia consimilis* (Limenitis consimilis, Boisd. Voy. Astrolabe, Lep. p. 133). Snellen, Tijds. voor Ent. 1889, p. 388, pl. 9, fig. 2. Staudinger, Exot. Schmett. pl. 50. *Habitat.* New Guinea; N. Australia.—*Atharia affinis* (Neptis affinis, Felder, Novara Reise, Lep. iii. p. 426). *Habitat.* Aru.—*Atharia continua* (Neptis continua, Staudinger, Exot. Schmett. p. 146). *Habitat.* Jobi.

Genus *ANDASENODES* (Moore, Lep. Ind. iii. p. 146 (1898).—*Forewing* elongated, narrow; costa almost straight, apex rounded, exterior margin very slightly oblique, scalloped, posterior margin long, recurved; first and second subcostal branches emitted before end of the cell; discocellulars very short, second outwardly-oblique; cell open. *Hindwing* rather elongated and narrow; anterior margin well arched, exterior margin very oblique, convex, scalloped; precostal short, straight. *Body* moderately stout; palpi slender, laxly clothed with long fine hairs; antennal club stout, obtuse at tip; eyes naked. *TYPE.* A. mimetica.—*Andasenodes mimetica* (Neptis mimetica, Grose-Smith, Nov. Zool. ii. p. 78 (1895). A mimic of the Euploëine butterflies *Andasena Orope*, and of *Doricha variabilis*. *Habitat.* Dili, Timor.—*Andasenodes Eblis* (Neptis Eblis, Butler, Ann. Nat. Hist. 1882, p. 43. Grose-Smith and Kirby, Rhop. Exot. Nept. pl. 1, fig. 1, 2 (1895). A mimic of, probably, a species of *Calliplœa*. *Habitat.* New Britain.

Genus *RASALIA* (Moore, Lep. Ind. iii. p. 146 (1898).—Male. Wings small. *Forewing* subtriangular; costa very slightly arched, apex rounded, exterior margin slightly oblique, scalloped, posterior margin much recurved; first and second subcostal branches emitted before end of the cell; discocellulars very short, second

bent inward; cell open. *Hindwing* broadly ovate, short; anterior margin much arched, exterior margin convex and scalloped; precostal vein bifid; costal vein ending at fully one-third before the apex. *Body* slender; palpi very slender; eyes naked. TYPE. *R. gracilis*.—*Rasalia gracilis* (Athyma gracilis, Kirsch, Proc. Zool. Soc. 1885, p. 276, pl. 19, fig. 4). *Syn.* Neptis Dohertyi, Grose-Smith, Nov. Zool. ii. 1895, p. 79. *Habitat.* Tenimber, Timor Laut.

Group V. NYMPHALINA.

Hamadryades, Hübner, Tentamen, p. 1 (1806).

Nymphalides (part), Boisd. Ind. Méth. p. 16 (1840).

Vanessidæ, Duponchel, Catal. Méth. Lep. Eur. p. 6 (1844).

Vanessidi, Stephens, Catal. Brit. Lep. B. M. p. 11 (1850). Stainton, Manual Brit. Lep. p. 21 (1857).
Scudder, Butt. E. U. S. p. 306 (1889).

Vanessides, Kirby, Eur. Butt. p. 36 (1862). Butler, Catal. Fabr. Lep. p. 69 (1869).

Nymphalina (part), Herr. Schœff. Prod. Syst. Lep. p. 17 (1864). Distant, Rhop. Malay. p. 83 (1882).

Nymphalides (part), Butler, Catal. Fabr. Lep. p. 46 (1869).

Diademæ (part), Butler, Catal. Fabr. Lep. p. 98 (1869).

Nymphalidæ (part), Lang, Rhop. Eur. p. 159 (1884).

Kallimæ et Apaturinæ, Doherty, Journ. As. Soc. Bengal, 1886, pp. 109, 121.

Nymphalidæ (Vanessa group, part), Staudinger and Schätz, Exot. Schmett. ii. p. 122 (1887).

Nymphalina, Moore, Lep. Indica, ii. p. 225 (1895).

CHARACTERS OF THE GROUP NYMPHALINA.*

IMAGO.—*Forewings* elongately triangular, or triangular; apex obtusely angled or rounded, in some produced to a more or less distinct point; exterior margin either more or less slightly scalloped and with a more or less prominent outward angle below the apex and a lesser angle at the lower median veinlet, or the entire margin slightly but obtusely scalloped, or more or less even. *Hindwings* short, obovate, or somewhat quadrate, the exterior margin either more or less slightly scalloped, or nearly even, or, in some the apex is slightly excised, and with a short broad caudate angle at end of the upper median veinlet; or, in some the wing is triangular, with the exterior margin nearly or quite even, and the anal angle produced into a lobate tail.

LARVA.—Head mostly very slightly cleft, in some surmounted with two minute tuberculous-spines or very short stellate-spines, or armed with two long erect branched-spines or two fleshy-spines. Body armed with longitudinal series of branched-spines, or with a single dorsal fleshy-spine on sixth and twelfth segment.

* See Note in Lep. Indica, vol. ii. p. 226.

PUPA.—Stout; dorsum arched, abdominal segments mostly with dorsal and lateral conical points; thorax obtusely or angularly conical posteriorly; head-piece more or less bifid.

SEASONAL DIMORPHISM.—We have separated and described the *wet-season* and *dry-season* forms occurring in the genera *Cyrestis*, *Apsithra*, *Junonia*, *Polygonia* (*Grapta*), *Araschnia*, *Symbrenthia*, *Apatura* (*Hypolimnas*), and *Kallima*.

MIMICRY.—In the genus *Apatura* (*Hypolimnas*) the two well-known species *Bolina* and *Misippus* furnish the most striking examples of mimicry to be found among butterflies. Colonel C. Swinhoe, in his paper on "Mimicry in butterflies of the genus *Hypolimnas*" (*Journ. Linn. Soc. Zool.* 1895, p. 340), writes: "In *Bolina*, Linn., as we find it in Asia, the female only is mimetic, the males in all localities being of the normal form. In India the female universally mimics the common protected butterfly, *Euplœa Core*, of Cramer. The typical *Core* does not range very far South, one or two have been taken in Mergui, but there is no record of its more Southern extension, its place being taken by other common black *Euplœas* of somewhat similar pattern. We find accordingly, that *Bolina* varies so as to resemble all the common *Euplœas* of the different islands of the Malay Archipelago. The female of *Misippus*, with the exception as a very rare variety, which resembles the male in appearance, always mimics the commonest of all the *Danainæ*, i.e. *Danaïs Chrysippus*, which is common all over India, Burma, Ceylon, the Malay Archipelago, Madagascar, Aden, and the West, South, and South-East Coasts of Africa; in all these localities *Misippus* also exists, the female being of the *Danaïs* colour and pattern, and where *D. Chrysippus* does not exist, *Misippus* is not to be found. In Africa and Aden there are several forms of *Danaïs Chrysippus*—some without the white-banded black apical patch to the forewings (*D. Dorippus*, Klug); some possessing this marking, but characterized by white hindwings (*D. Alcippus*, Cramer); and also others with the *Dorippus* pattern and white hindwings. All these forms are mimicked in their several localities by the females of *Misippus*. In India, the form of female *Misippus* which mimics *Danaïs Dorippus* (without the black and white apical patch) is also found." The form of female *Misippus* which mimics *Danaïs Alcippus* (*Alcippoides*, Moore) is also occasionally found in India.

Genus CYRESTIS.

Cyrestis, Boisduval, Voy. Astrolabe, p. 117 (1832); *id.* Ann. Mus. Hist. Nat. 1833, p. 190. Westwood, Gen. D. Lep. ii. p. 260 (1850). Distant, Rhop. Malay. p. 139 (1883). de Nicéville, Butt. of India, etc., ii. p. 248 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 155 (1888). *Cyrestis* (sect. 1), Felder, Neues Lep. p. 24 (1861).

IMAGO.—Wings short. Forewing rather broad, triangular; costa slightly arched, apex obtusely pointed, exterior margin slightly oblique and sinuous, ex-

cavated above the posterior angle, posterior margin recurved; costal vein extending to middle of costa; first subcostal veinlet emitted at one-fifth before end of the cell and ending at a little beyond the costal vein; second subcostal at one-tenth before end of cell; third subcostal at fully one-half beyond the cell; the cell very short and broad, closed; upper discocellular veinlet very short, middle discocellular concave, lower discocellular almost straight, very slender; middle median veinlet emitted close to lower end of cell. *Hindwing* broad and prolonged posteriorly; anterior margin rather short, lobate at the base and excavated before the apex, which is acute; exterior margin oblique, scalloped from the apex and produced to a spatular-tail at end of upper median veinlet and broadly-lobate between lower median and the submedian; precostal vein curving from its base, slender, simple; costal vein much arched from base of precostal and thence extending close along the margin to near the apex; cell broad, closed; subcostal branch widely separated from the costal; upper discocellular outwardly curved, lower discocellular outwardly oblique and very slender; middle median emitted close to end of cell. *Body* slender; palpi long, rather slender, directed upwards to middle of eyes and then porrected and projecting more than half its length beyond the head, somewhat cylindrical, the sides slightly flattened, very compactly clothed with short hairy scales which are slightly lax above and at base beneath, terminal joint nearly as long as second and obtusely pointed; forelegs of male short, very slender; femur scaly above, clothed beneath with fine long silky hairs; tibia scaly; tarsus sparsely clothed with very short hairs. Forelegs of female longer; femur scaly above, finely hairy beneath; tibia and tarsus smooth; tarsus broadly dilated towards end, apical joints minute, stoutly spined; antennæ slender, with a gradually-formed elongate club; eyes naked. *Type*.—C. Thyonneus.

LARVA (C. Thyodamas).—"Slender, cylindrical, smooth; with two long, curved, divergent filaments, or soft horns, on the head; a single stouter sword-shaped one on the back of the fifth or sixth segment, curved backwards and serrated on its inner edge; another on the last segment, curved forwards and serrated on its outer edge" (*Davidson*).

PUPA.—"Suspended by the tail. Very much compressed; with a dorsal ridge from head to tail, high and obtusely pointed in the middle; palpi cases united and produced into a long somewhat recurved snout" (*Davidson*).

EGG.—"High domed-shape, or almost conical, with an aperture at the top fitted with a deeply dentate flat cap, like a cogged wheel" (*Davidson*).

HABITS OF IMAGO.—"All the species of this genus are very elegant insects on the wing, having a floating sailing flight, often settling on the wet sand on the borders of a stream to suck up the moisture, with wings very wide outspread and lying flat on the ground, the forewings much advanced in front of the head; if disturbed they

disappear with great rapidity, as they settle suddenly with outspread wings on the underside of a leaf, where they are quite invisible from above. They are nearly always found near water. In Simla, *Thyodamas* may often be seen at rest on a bare quartz rock in mid-stream, its delicately pencilled markings exactly harmonizing with the veinings of the stone" (*de Nicéville*).

CYRESTIS THYODAMAS (Plate 306, fig. 1, 1a, *larva* and *pupa*, 1, b, c, ♂ ♀).

Cyrestis Thyodamas, Boisduval, Cuvier's Rég. Anim. Ins. ii. pl. 138, fig. 4 (1836). Doubleday and Hewitson, Gen. D. Lep. pl. 32, fig. 3 (1848). Westwood, *id.* ii. p. 261 (1850). Butler, Ann. Nat. Hist. 1885, p. 307. de Nicéville, Butt. India, ii. p. 251 (1886). Leech, Butt. of China, etc., i. p. 248 (1892). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 256, pl. 3, fig. 2, *larva*. Mackinnon, *id.* 1898, p. 376, pl. U, fig. 11, *larva* and *pupa*. Staudinger and Schätz, Exot. Schmett. ii. pl. 23 (1888).

Amathusia Ganescha, Kollar, Hugel's Kaschmir, iv. pt. 2, p. 430, pl. 7, fig. 3, 4 (1844).

Cyrestis Ganescha, Butler, Ann. Nat. Hist. 1885, p. 308; *id.* P. Z. S. 1886, p. 363.

IMAGO.—Male and female. Upperside either pure white (probably *wet-season* brood) or of various shades from white to pale rich yellowish-ochreous (probably *dry-season* brood); veins mostly black. *Forewing* crossed by four irregularly-undulated slender black lines, the first line subbasal, second and third medial, the fourth discal and sinuous posteriorly, followed by three submarginal parallel lines; interspaces between the discal and outer lines, apically, more or less powdery fuliginous-brown or grey, with a small, white-centred oval spot between the veins, the lower outer interspaces broken by a fuliginous or olive-brown patch, the inner median and submedian spaces being more or less bright ochreous and inwardly edged with steel blue, the latter centred with three prominent white spots inwardly edged with black; base of costal border brownish-ochreous; a subbasal black line across the cell, a curved line before the end, and two discocellular lines, their upper interspaces and a costal patch beyond being brownish-ochreous. *Hindwing* crossed by three medial slender black lines, the middle line angulated towards the costa, followed by a broader outer-discal black line, outwardly-edged with steel blue, a slender inner-submarginal wavy line, and then by two outer thicker irregular lines, between the outer-discal and inner submarginal is a row of elongated oval white spots, which are inwardly-edged with black and bordered anteriorly with olivescence-ochreous, and posteriorly with yellowish-ochreous; anal lobes, more or less, yellowish-ochreous, or brownish-ochreous, irregularly marked with black spots and streaks edged with white; abdominal border brownish-ochreous, edged by a black streak at base of costa; tail black, edged with white. Underside paler and of a pinkish-white; markings as above, but less prominent, the anal lobes brighter ochreous and the black spots

larger; costa and abdominal border white. *Body* with a dorsal and lateral black stripe edged with white or pale ochreous; palpi above clothed with black and ochreous hairs, beneath ochreous-white; legs white; antennæ black, annulated with white beneath.

Expanse, ♂ ♀ 2 to $2\frac{8}{10}$ inches.

LARVA.—“Slender, cylindrical, smooth; with two long, curved, divergent filaments or soft horns on the head, a single stouter sword-shaped one on the back of the fifth or sixth segment, curved backwards and serrated on its inner edge, and another on the last segment, curved forwards and serrated on its outer edge. Colour fine reddish-brown, with a broad green band on the side from the fifth to the last segment. Feeds on the leaves of *Ficus indica*.”

PUPA.—“Suspended by the tail; very much compressed; with a dorsal ridge from head to tail, high and obtusely pointed in the middle; palpi cases united and produced into a long somewhat recurved snout; colour brown, with fine dark striæ.”

EGG.—“High-domed shape, or almost conical, with an aperture at the top fitted with a deeply dentate flat cap, like a cogged wheel” (*Davidson, l.c.* 351).

HABITAT.—W. and E. Himalayas; Assam; Cachar; Khasias; Bombay; S. India; Burma; Tenasserim; W. China; Hainan; Formosa; Japan.

DISTRIBUTION.—We possess examples of both the white and pale ochreous forms from the Western Himalayas, taken at Kasauli, Simla, and Masuri, a white male from Nepal, taken by the late Gen. G. Ramsay, both sexes from Sikkim, Assam, and the Khasias; others from S. India, taken in the Wynaad and Nilgiris, a pale ochreous female from Coorg, a white male from Mynal, Travancore, taken in March, at 2000 feet elevation; white males from Bhamo, taken in November by Signor L. Fea, from Upper Burma, by Col. C. H. E. Adamsom, a male from Moolai, Upper Tenasserim, and white males from W. China and Japan. Mr. J. H. Leech has both sexes of the white and ochreous forms from Moupin, and Omeishan, W. China, and a white female from the Loochoo Islands. It is also recorded from Hainan (*P. Z. S.* 1878, 698), and from Formosa (*id.* 1877, p. 813). The late Capt. R. Bayne Reed took it in Kashmir in 1872 (MS. Note), and Capt. H. B. Hellard also took it in “Kashmir in September” (MS. Notes). Mr. P. W. Mackinnon found it “very common in Masuri and in the interior, and it is not rare in the Doon. It flies all through the warm weather.” Capt. A. M. Lang took it at “Kasauli in May, and at Kundloo from April to October” (MS. Notes). The Rev. J. H. Hocking records it from the Kangra Hills, “June to September, hibernates afterwards. Sits with open wings upon hanging leaves of Oak and Rhododendron” (*P. Z. S.* 1882, 240). Mr. W. S. Atkinson records it from “Hills in Central India, Parisnath Hill, Sikkim, and Khasias” (MS. Notes). Col. C. Swinhoe records it as “common on the Khasia

Hills" (Tr. Ent. Soc. 1893, 288). Mr. E. H. Aitken observed it as "rare at Mahableshtar, Bombay."

Mr. W. Doherty records it from "Kumaon generally, at 2000 to 8000 feet elevation" (J. A. S. Beng. 1886, 122). Major J. W. Yerbury obtained the male at "Murree, N.W. Himalayas, in August" (P. Z. S. 1886, 363). Mr. S. N. Ward took it in "Malabar and Kanara." Mr. G. F. Hampson took it "throughout the Nilgiri District," and remarks that the yellow form does not occur there (J. A. S. Beng. 1888, 355). Mr. H. S. Ferguson records it as "common on the Travancore Hills" (J. Bombay N. H. S. 1891, 9). Capt. E. Y. Watson took "numerous specimens at Kathlekan, Mysore, in November, and at the Gersoppa Falls in January (*id.* 1890, 5). "Common in Sikkim up to about 6000 feet elevation, from March to December" (H. J. Elwes, Tr. Ent. Soc. 1888, 365). In the British Museum is an ochreous female from Bhotan, taken in July, others of the white form from Tilin Yaw, Burma, taken in November, Papun in December, and King Island, Mergui, December. Dr. F. Manders records it from "Fort Stedman, Shan States, and Eastern Karenee, Burma" (Tr. Ent. Soc. 1890, 525).

HABITS OF IMAGO.—"This beautiful insect, very appropriately called 'the map butterfly,' is frequently to be seen soaring backwards and forwards over some mountain stream, with richly wooded sides. It frequently settles, often with wide-spread wings, on a quartz rock, where, by reason of its coloration and markings, it is almost impossible to see. It has also a habit of suddenly settling on the *underside* of some broad leaf overhanging the water, with wings wide outspread, a feat of gymnastics I have never seen any other butterfly accomplish. It is on the wing from early summer, and I have taken perfect specimens as late as the middle of November at Simla" (de Nicéville, Indian Agriculturist, 1880). "A Western-Himalayan forest-insect, difficult to capture at all. It generally frequents a well-wooded glen; and in such a place I have often watched its elegant soaring flight, far out of reach, as it flitted over the blossoms of the horse-chestnut (*Pavia indica*), or rested on its broad leaves in the sunshine. I have also seen it floating up and down the foliage-covered face of a steep cliff overhanging a hill torrent, and rarely would it come within reach" (Capt. A. M. Lang, Ent. Mo. Mag. 1864, 132). "The 'map butterfly' is pretty common throughout the Karwar District of Bombay, in suitable situations—such as clear streams of running water among rocks, with trees growing over it, on which the butterfly may rest, pressed flat against the underside of a leaf. Curiously enough it lays its eggs on the Banian tree (*Ficus indica*), which is not a tree at all peculiar to such situations (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 256; *id.* 1890, 351).

FOOD-PLANTS OF LARVA.—A female was noticed by Mr. J. R. Bell, on October 10th, depositing its eggs on the tenderest leaves and buds of the Banian tree

(*Ficus indica*), and secured six, of which two were reared" (E. H. Aitken, *id.* p. 351). Mr. P. W. Mackinnon found the "larva, in Masuri, feeding on *Ficus nemoralis*, and in the Doon, upon *Ficus glomerata*" (J. Bomb. N. H. S. 1898, 376).

Of our illustrations of this species on Plate 306, fig. 1 is a reproduction of Mr. Mackinnon's figures, and fig. 1a of Mr. Davidson's figures, of the larva and pupa; fig. 1b is a male of the white (*wet-season*) form, and fig. 1c, a female of the pale ochreous (*dry-season*) form.

CYRESTIS ANDAMANICA (Plate 306, fig. 2, 2a, ♂ ♀).

Cyrestis Thyodamas, var. *Andamanica*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 246.

Cyrestis Thyodamas, var. *Andamanensis*, Staudinger, Exot. Schmett. p. 132, pl. 45, ♂ (1888).

IMAGO.—Male and female. "Differs from Continental Indian and Burmese *C. Thyodamas* in the blacker apex and outer margin, in the prominent somewhat diffused black spot on the third median veinlet between the third and fourth transverse black lines of the forewing, and in having the fulvous marks of the anal half of the abdominal margin, of the anal angle, and of the outer margin as far as the discoidal vein, of the hindwing, much diffused and darker; in having, in fact, all the markings and colouring darker both above and below,"

Expanse, ♂ ♀ $2\frac{2}{10}$ to $2\frac{4}{10}$ inches.

HABITAT.—South Andamans.

CYRESTIS NIVALIS (Plate 307, fig. 1, 1a, ♂).

Cyrestis Nivalis, Felder, Reise Novara, Lep. iii. p. 414 (1866). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 429.

Cyrestis Nivea, var. *Nivalis*, Distant, Rhop. Malay. p. 140, pl. 12, fig. 3, ♂ (1883).

Cyrestis Nivea, de Nicéville, Butt. of India, etc., ii. p. 252 (1886).

Cyrestis Nivea, var. *interrupta*, Snellen, Tijds. v. Ent. 1890, p. 217.

IMAGO.—Male and female. Upperside white. *Forewing* crossed by three outwardly-curved oblique waved equidistant very slender black lines, the first subbasal, the second medial, and the third discal; base of costal border to medial transverse line irregularly black and longitudinally streaked with ochreous; cell crossed by a slender black line near the base, and with two similar waved lines at the end; outer margin with a broad black band traversed by three entire outer and two broken inner pale fuliginous-white slender lines, the two inner upper lines with an intervening white oval dot, the inner edge of the band is irregularly waved—being

in reality a fourth transversal line, its middle portion excavated between the radial and middle median veinlet, its lower end zigzag, the posterior angle being broadly bright ochreous with two black central dots and short ascending outer white streaks. *Hindwing* crossed by three similar-positioned oblique almost straight very slender black lines, the two inner angularly bent upward near the abdominal margin, the inner one extending upward in a black streak to the base of the costa; two submarginal black streaks curving from the costal angle to near anal angle, their lower ends waved, followed by an outer parallel slender line, then by an oblique streak from the upper marginal angle, and again by a slender marginal line, the latter ending in two black caudal marginal streaks; lower area of abdominal border, the anal lobe and lower outer border of the streaks bright ochreous; anal lobes with black spots and short white streaks. Underside white; transverse lines and marginal borders as above, but paler; costal basal band and abdominal marginal markings absent. *Body* above with a dorsal and lateral longitudinal black streak bordered with ochreous and white; body beneath and legs white; palpi above clothed partly with black and ochreous hairs, beneath white; antennæ black, partly annulated with white beneath.

Expanse, ♂ 2 to $2\frac{3}{10}$, inches.

HABITAT.—Upper Burma; Tenasserim; Malay Peninsula, Penang; Sumatra; Sarawak; Borneo.

DISTRIBUTION.—“Found commonly in Burma, the Malay Peninsula, Sumatra, and Borneo. In Sumatra it is found on forest roads, where it settles with wide-spread wings on moist places and by the side of small pools; if pursued, it settles on the underside of leaves by the roadside. On the wing, when flying rapidly along a forest road in search of moisture, it may easily be taken for a Pierine butterfly” (de Nicéville J. A. S. Beng. 1895, 429). Lieut. E. Y. Watson took it in “Upper Burma in the spring, and Capt. Bingham in the Donat Range in April, and in the Thoungyeen forests in December” (*id.* Butt. Ind. 253). Mr. E. Bartlett records it as “very plentiful at times in Sarawak, having the habit of flying along the roads in a direct line, very similar to a Pierine butterfly, for which it may be mistaken.”

CYRESTIS TABULA (Plate 307, fig. 2, 2a, ♂).

Cyrestis Tabula, de Nicéville, Journ. Asiatic Soc. Bengal, 1883, p. 1, pl. 1, fig. 1, ♂; Butt. of India, etc., ii. p. 253 (1886). Doherty, Journ. As. Soc. Beng. 1886, p. 258, ♀.

IMAGO.—Male. “Upperside rich deep ochreous with black markings; veins mostly defined with black. *Forewing* with a short longitudinal streak at base of the cell, immediately beyond this a transverse one reaching from the median veinlet to the costa; then a pair of streaks which are wide apart at the median veinlet, but

joined on the subcostal veinlet; the discocellular veinlets defined with a fine black line; beyond which is a bow-shaped figure composed of two fine lines joined at their lower ends, the outer line straight, the inner one curved, with their points resting on the second median veinlet and subcostal veinlet; below the cell a pair of streaks reaching the posterior margin, the origin of the first one being where the first median, and the outer one where the second median veinlet is given off, the interspace being thickly irrorated with black scales, leaving but little of the ochreous ground-colour visible; two transverse discal black lines from the subcostal to posterior margin, the outer line lunulate, the inner one sinuate, the two lines being nearest together at their middle, and both inwardly edged with black scales; a submarginal series of seven bright ochreous spots, broadly inwardly defined with black, one in each interspace except the two lower, which are smaller and placed between the lower median and submedian vein; the outer margin broadly black, bearing two obsolete paler lines. *Hindwing* crossed by four black lines, the space between each pair, and between both pairs being thickly irrorated with black scales, especially at the lower extremity of the outer pair, where the ground-colour is entirely black, at the upper extremity the ground-colour increasingly to the costa is very pale ochreous; a submarginal line composed of six lunules, each lunule having a bright ochreous spot placed outwardly against it; the outer margin more broadly black than in forewing, the black portion ending at the lower median veinlet, bearing two intensely black marginal lines, the outer line defined on both sides with a pale fine line, the outer of these two pale lines becoming almost pure white from the tail to anal lobe; the lobe and a round spot above it, is bright ochreous, defined, especially outwardly, with black; there are also some small white, black, and metallic steel-blue markings above the round ochreous-spot; tail black, the tip white. Underside pale ochreous, the outer portion of the wings, and on either side of the submarginal lunules on the hindwing, somewhat deeper ochreous, becoming ferruginous at the anal angle. All the markings of the upperside, but narrower and better defined, with no black irrorations, the outer margins, except the extreme edge, which is black, concolourous with the rest of the wings; the veins throughout pale ochreous. *Body* rich ochreous above, marked with three black lines, beneath pale ochreous; antennæ black, the tip ochreous" (*de Nicéville l.c.*).

Female. "Differs from the male in being white below instead of pale orange-ochreous; above it is only slightly tinged with ferruginous, and is somewhat like *C. Thyodamas*, except that the lighter spaces are heavily clouded with grey" (*Doherty, l.c.*).

Expanse, $2\frac{2}{10}$ to $2\frac{5}{10}$ inches.

HABITAT.—Great Nicobar.

NOTE.—"It is somewhat variable, the type specimen is very much darker than

others subsequently received; in the former alone is the black irroration between the common discal lines of the upperside of both wings present" (*de N. l.c.*).

DISTRIBUTION.—"This species seems to be confined to the island of Great Nicobar, where the late Mr. F. de Roepstorff and Mr. E. H. Man have each obtained two males. Mr. Doherty also obtained both male and female at Great Nicobar, who states that the female, when flying, resembles the white *C. Thyodamas*, for which he at first mistook it" (*l.c.*).

Our illustrations of this species on Plate 307 are reproduced from Mr. de Nicéville's figures.

INDO-MALAYAN SPECIES.—*Cyrestis Nivea* (Amathusia Nivea, Zinken-Sommer, Nova Acta Acad. N. C. 1831, p. 138, pl. 14, fig. 1, ♂. *Habitat.* Java.—*Cyrestis Lutea* (Amath. lutea, Zink. Som. *l.c.* p. 140, pl. 14, fig. 2, ♂ (1831). *Habitat.* Java.—*Cyrestis Fadorensis*, Kheil, Rhop. Nias, p. 22, pl. 3, fig. 2 (1884). *Habitat.* Nias Island.—*Cyrestis superbus*, Staudinger, Deuts. Ent. Zeit. Lep. 1889, p. 53. *Habitat.* Palawan.—*Cyrestis Mænalis*, Erichson, Nov. Act. Ac. N. C. (1834), p. 402, pl. 50, fig. 3. Semper, Reis. Phil. Lep. p. 113, pl. 21, fig. 3, 4, ♂ (1888). *Habitat.* Philippines.—*Cyrestis Irmæ*, Forbes, Nat. Wanderings, p. 274 (1885). Waterhouse, Aid, 11, pl. 176, fig. 2. de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 358. *Syn.* *Cyrestis Sumatrensis*, Staudinger, Exot. Schmett. p. 133 (1888). *Habitat.* Sumatra; Malay Peninsula.—*Cyrestis obscurior*, Staudinger, D. Ent. Zeit. Lep. 1889, p. 53. *Habitat.* Philippines.—*Cyrestis seminigra*, Grosse-Smith, Ann. Nat. Hist. 1889, p. 313. Pryer and Cator, Brit. N. Borneo Herald, 1894, p. 260. *Habitat.* N. Borneo.—*Cyrestis Theresæ*, de Nicéville, Journ. As. Soc. Bengal, 1894, p. 18, pl. 5, fig. 8, ♂. *Habitat.* N.E. Sumatra,

Genus CHERSONESIA.

Chersonesia, Distant, Rhop. Malayana, p. 142 (1883). Semper, Reisen Phil. Lep. p. 111 (1888).

Cyrestis (sect. 2), Felder, N. Lep. p. 24 (1861).

Cyrestis (part), Westwood. de Nicéville.

IMAGO.—Wings small, short. Male. *Forewing* triangular; costa arched, apex obtuse, exterior margin slightly oblique, nearly straight and even; first subcostal branch emitted at one-fifth before end of the cell, second at about one-third beyond the cell; upper discocellular extremely short, middle slightly concave, lower recurved and extremely slender, joining the median at some distance before its middle branch. *Hindwing* broad; apex oblique and almost rounded; exterior margin uneven, angled at end of upper median and slightly lobate before anal angle; precostal vein short, very slender, starting from the costal at some distance above base of subcostal; upper discocellular at a short distance beyond base of

subcostal branch, lower discocellular extremely slender, outwardly oblique; two upper medians from end of cell. *Body* slender; palpi slender, flattened, smoothly scaled, laxly hairy at base and apex of second joint above, second joint curved upward, third joint projected forward; antennal club robust; eyes naked.

TYPE.—C. Rahria.

LARVA.—Cylindrical, smooth, with two straight fleshy filaments projecting forward from the head, a single backward-curved dorsal filament on fifth segment, and a similar one on the twelfth or last segment. Colour pale green, with a dorsal pale pinkish band.

PUPA.—Tapering from the end, thorax obtusely angled above; with a medio-dorsal biangulated process; head-piece with two curved projected processes. Colour pale green, dorsal and frontal processes brown. (Described from Hagen's figure (Iris, 1896, pl. 1.)

HABITS OF IMAGO.—Mr. de Nicéville states that "all the species of *Chersonesia*, in Sumatra, occur only in forests, and, unlike true *Cyrestis*, never go to roads or moist places, but keep to low bushes, and rest on the underside of the leaves. They fly weakly, and are easily captured" (J. A. S. Bengal, 1895, 432). The late Mr. W. S. Atkinson, in his MS. Notes, says that *C. Risa* "settles on the underside of leaves with the wings distended."

CHERSONESIA RISA (Plate 307, fig. 3, 3a, b, ♂ ♀).

Cyrestis Risa, Doubleday and Westwood, Gen. D. Lep. ii. p. 262, pl. 32, fig. 4 (1850). Moore, P. Z. S. 1878, p. 829. de Nicéville, Butt. of India, etc., ii. p. 256 (1886).

Chersonesia Risa, Distant, Rhop. Malay. p. 142 (1883). Doherty, J. As. Soc. Bengal, 1886, p. 122.

IMAGO.—Male. Upperside rich ochreous or yellowish-ochreous. Both wings crossed by a basal pair of fine black straight lines, the space within irrorated with black scales; another pair beyond; two similar discal lines, the outer one of which has a series of more or less pale ochreous-yellow triangular patches along its inner edge, these patches being most prominent on the hindwing, followed by a steel-blue line which is somewhat macular and less defined on the forewing, where it is divided in the middle by a more or less pale ochreous-yellow patch and other smaller anterior patches on a dusky-speckled ground; beyond is a submarginal fine black wavy line and a straight marginal line. *Forewing* also with a basal-costal black line, and two discocellular fine black lines. *Hindwing* also with a single discocellular fine black line, two outer discal and submarginal lines sinuously bent inward at their lower ends, and with two small black central dots above anal lobe; marginal line inwardly-edged with violaceous-white from the anal angle. Underside paler, markings

similar to above, less defined, the spaces between the transverse lines palest and faintly tinged with violaceous-white.

Female. Upper and underside as in male. *Body* ochreous, with a dorsal and lateral black line; palpi and legs ochreous; antennæ black, annulated with white beneath.

Expanse, ♂ ♀ $1\frac{5}{10}$ to $1\frac{8}{10}$ inch.

HABITAT.—Kumaon; Nepal; Sikkim; Bhotan; Assam; Silhet; Burma; Upper Tenasserim.

DISTRIBUTION.—Mr. W. Doherty records it from the “Kali Valley, 2000 to 3000 feet elevation, in Kumaon” (J. A. S. Beng. 1886, 122). It is “a common species in Sikkim at low elevations, and occurs to the Eastward as far as Sibsagar, in Assam” (de Nicéville, l.c.). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 289). Mr. W. S. Atkinson says it “settles on the underside of leaves with the wings distended” (MS. Notes). Col. C. H. E. Adamson obtained it in the “Moulmein District, but not common; one specimen also taken in Upper Burma in February” (List Burm. Butt. 26, 1896). Col. Adamson also has a male taken at Pyin Myoung, Shan Hills, in July. It is recorded from “Moulmein to Meetan, and Moolai 3000 to 6000 feet, in December” (P. Z. S. 1878, 829). Mr. W. Doherty obtained it in “East Pegu at low elevations” (P. Z. S. 1891, 283). Mr. P. Crowley has a male from the Karen Hills, Burma.

CHERSONESIA RAHRIIDES (Plate 307, fig. 4, 4a, ♂ ♀).

IMAGO.—Male. Upper side reddish-ochreous. *Forewing* crossed by two sub-basal and two inner-discal slender black lines, which are equidistant one from the other and are very slightly excurved, followed by a medial-discal slender straight, dusky fascia, an outer-discal black recurved line, and then by two submarginal almost straight lines; between the outer-discal and inner submarginal line are two subapical and two posterior short black slender linear streaks, the lowest of the latter being broken and less linear; within the cell is a short black very fine line contiguous and parallel to the inner subbasal line, a similar oblique line beyond the second subbasal line, and two similar short lines bordering the discocellular veinlets. *Hindwing* crossed by two subbasal and two medial-discal equidistant slender black straight lines, a medial-discal slender straight dusky fascia; an outer-discal and an inner submarginal slender black line centred with a linear row of fine slender black short streaks, the two latter outer lines being joined at the lower median veinlet and ending in a double black-speckled ringlet centred with two short black streaks above the anal angle; outer submarginal line extremely slender, being black-and-yellow speckled, and ending in two blue lunules above the anal lobes, these two lunules

having their outer edge and adjacent cilia of the lobes conspicuously black; outer marginal angle at end of upper median and its cilia also black. Underside yellowish-ochreous; markings similar, the outer lines being less distinct. *Body* and palpi above reddish-ochreous; thorax and abdomen with a slender black dorsal line; body beneath and legs yellowish-ochreous; antennæ blackish, shaft annulated with white.

Female. Upperside paler ochreous, the interspace between the subbasal and medial, and of the discal and outer marginal lines being yellowish-ochreous; all the markings less defined.

Expanse, ♂ ♀ $1\frac{2}{10}$ to $1\frac{6}{10}$ inch.

HABITAT.—Burma; Upper Tenasserim.

NOTE.—From specimens of equal size, of the Malayan, Sumatran, Nias, Borneo, and Java *C. Rahria*, the Burmese examples differ from all, on both the forewing and hindwing, in the two inner-pair of transverse lines being nearer together, and therefore comparatively more equidistant apart; the discal transverse fascia is more slender and straighter, the discal interspace between the lines narrower, the two outer-discal lines are also wider apart, straighter, and less catenulous on the hindwing, and the short central streaks more slender. On the hindwing the two anal black lobe-marks, and of the marginal angle (as described above), is not present in any specimen examined from the other-named localities.

DISTRIBUTION.—Col. C. H. E. Adamson has specimens taken at Pyin Myoung, Shan Hills, in July, Kathapa in February, and “Burma” in November. Dr. N. Manders took it in “Eastern Karenee” (Tr. Ent. Soc. 1890, 525). It also occurs in Upper Tenasserim.

CHERSONESIA PERAKA.

Chersonesia Peraka, Distant, Ann. Nat. Hist. 1884, p. 199; Rhop. Malayana, p. 443, pl. 40, fig. 6 (1886).

IMAGO.—“Male and female. Smaller than *C. Rahria*; the ground-colour more ochreous and less rufous; markings similar, but with the transverse fasciæ broader, much darker, and placed close together. The obsolete caudate prolongations in *C. Rahria* near the apices of the third and first median veinlets are scarcely visible in *Peraka*, and the structural peculiarity exists in the first subcostal nervule of the forewing, which, in this species, impinges near its base on the costal nervure. The female has the ground-colour paler than in the male, the wings broader, and the apex of the forewing more rounded.”

Expanse, ♂ $1\frac{1}{10}$, ♀ $1\frac{3}{10}$ inch.

HABITAT.—Tenasserim; Malay Peninsula.

DISTRIBUTION.—Mr. de Nicéville records specimens, in his own collection, from the Dounat Range, Tenasserim, Perak, Malay Peninsula, and N.E. Sumatra (J. A. S.

Bengal, 1895, 431). Specimens from Sarawak, Borneo, are in the British Museum.

MALAY SPECIES.—*Chersonesia Rahria* (Cyrestis Rahria, Moore, Catal. Lep. E. I. C. i. p. 147, pl. 3a, fig. 2, ♀ (1857). Distant, Rhop. Malay. p. 142, pl. 12, fig. 4, ♀ (1883). de Nicéville, Butt. India, ii. p. 256 (1886). Hagen, Deuts. Ent. Zeit. Iris, 1896, p. 178, pl. 1, fig. 4, 5, larva and pupa. Staudinger, Exot. Schmett. p. 133, pl. 45. *Habitat.* Java; Sumatra; Nias; Malay Peninsula; Borneo.—*C. intermedia*, Martin, Ein. Tagschmett. N.E. Sumatra, pt. 2, p. 4 (1895). *Habitat.* N.E. Sumatra.—*C. Neella*, Swinhoe, Ann. Nat. Hist. 1894, p. 430. *Habitat.* N. Borneo.—*C. Cyanee*, de Nicéville, Journ. Bombay, N. H. Soc. 1893, p. 49, pl. L, fig. 6, 7, ♂ ♀. *Habitat.* N.E. Sumatra.—*C. Nicévillei*, Martin, Ein. Tagschmett. N.E. Sumatra, p. 4 (1895). de Nicéville, J. A. S. Bengal, 1895, p. 431. *Habitat.* N.E. Sumatra.—*C. Celebensis*, Rothschild, Dresden Iris, 1892, p. 436. *Habitat.* Celebes.—*C. Mangolina*, Fruhstorfer, Berl. Ent. Zeit. 1899, p. 87. *Habitat.* Sula Mangol, S. Celebes.

Genus APSITHRA.

Forewing with the costa more convex than in typical *Cyrestis*, apex obtuse, exterior margin slightly angulate below the apex and not excavated above the posterior angle. *Hindwing* shorter and broader posteriorly, apex obtusely rounded, exterior margin convex, tail and anal lobes less produced.

TYPE.—A. Cocles.

APSITHRA COCLES (Plate 308, fig. 1, 1a, b, ♂ ♀ (*Wet-season form*)).

Papilio Cocles, Fabricius, Mant. Ins. ii. p. 7 (1787); Ent. Syst. iii. i. p. 65 (1793).

Cyrestis Cocles, Westwood, Gen. D. Lep. p. 260 (1850). Butler, Catal. Fabr. Lep. B. M. p. 82 (1869).

Moore, P. Z. S. 1878, p. 829. de Nicéville, Butt. of India, etc., ii. p. 254.

Cyrestis Formosa, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 246. Distant, Rhop. Malay. p. 442, ♂ (*wood-cut*).

Cyrestis Horatius, Wood-Mason and de Nicéville, Proc. As. Soc. Bengal, 1881, p. 142 ♂.

Cyrestis Earlei, Distant, Rhop. Malay. p. 141, pl. 13, fig. 5, ♂ (1883).

Cyrestis Natta, Swinhoe, Annals of Nat. Hist. (1899), p. 105, ♂.

IMAGO.—Male and female. Upperside. Both wings with a medial-discal transverse white band, the basal half of the wings and the broad outer border being more or less of a pale greyish sepia-brown. Cilia white; abdominal border greyish-white. *Forewing* with the inner edge of the discal white band very irregularly angulated, its outer edge generally nearly straight and even, but in some specimens slightly sinuous anteriorly; basal half crossed by a more or less dark ochreous sepia-brown

subbasal narrow broken fascia, bordered outwardly by a parallel pale fine whitish line edged by a blackish line; a similar dark ochreous sepia-brown broken fascia forming the irregular angulated edge of the white discal band, inwardly bordered by a white and black line; a short similar-coloured narrow streak, with its inner white and black line inwards, crossing base of cell; another, with the inner white and black edge lines on both its sides, a little beyond, and an angulated more sharply-defined one bordering the discocellulars; outer marginal clouded border traversed by a row of ill-defined bluish-grey ocelli, each with a slight black centre and pale outer ring, the one between the lower and middle median being much the largest, the one above it more or less obsolete, and all bordered by an inner and an outer ill-defined more or less whitish lunular line, beyond which is a sharply-defined marginal fine black line edged on both sides by a white line. *Hindwing* with the white discal band tapering to a point posteriorly and there bent inward above the anal angle, its inner edge undulated and its outer edge even; basal area crossed by a more or less dark ochreous sepia-brown subbasal fascia with an outer fine white and black edge-line, and a similar fascia with inner white and black irregular lines forming the undulated border of the discal white band; a short sharply-defined narrow angulated streak with its white and black line inwards, bordering the discocellulars; outer marginal clouded-border traversed by a row of ill-defined bluish-grey lunules, each with a slight black centre and pale outer edge, the one between the subcostals much the largest and ocellate, and all bordered by an inner and an outer ill-defined whitish lunular line; beyond which is a sharply-defined marginal fine black line edged on both sides by a white line; two similar diffused ocelli at anal angle inwardly bordered by an ochreous patch. Underside white, with a very delicate pale-pinkish flush, and the basal half slightly tinted with very pale grey; the basal and marginal transverse markings, as above, pale sepia-brown and partly obliterated, but the marginal ocelli and anal lobe-spot more prominent. *Body* and palpi above sepia-brown, below and legs white; antennæ brown, annulated with white beneath.

Expanse, ♂ ♀ 2 to 2 $\frac{4}{10}$ inches.

Plate 308, fig. 1, c, d, e, ♂ ♀ (*Dry-season form*).

Papilio Cocles, Donovan, Ins. India, pl. 23, fig. 2 (1800), ♂.

Cyrestis Formosa, Felder, Reise Novara Lep. iii. p. 412 (1867). Staudinger, Exot. Schmett. p. 133, pl. 45, ♀ (1888).

Cyrestis Cocles, var. *Andamanica*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal (1881), p. 246.

Cyrestis Cocles, Distant, Rhop. Malay, p. 442, pl. 41, fig. 13, ♂, de Nicéville, Butt. India, ii. pl. 23, fig. 107, ♂.

Male and female. Upperside. Differs from the wet-season form in having the

ground-colour creamy-white, the basal and marginal area very pale yellowish-ochreous, or pale greyish-ochreous, the basal area being also delicately tinted more or less with very pale olive-green; basal and marginal markings as in wet-season form, but more or less indistinctly-defined, and all of a pale ochreous, variable in shades of intensity in certain specimens, and defined with whiter borders. Underside white with a delicate pinkish flush; markings as above, pale ochreous, but more or less ill-defined; marginal ocelli and anal spot black.

Expanse, ♂ ♀ 2 to 2 $\frac{6}{10}$ inches.

HABITAT.—Sikkim; Bhotan; Khasias; Silhet; Orissa; Burma; Siam; Tenasserim; Andamans; Malay Peninsula.

DISTRIBUTION.—“Extremely rare in Sikkim, which is probably the westernmost limit of its range; single specimens have been taken at Singla and Sivoke, at low elevations in the spring and autumn. The difference in coloration observed in this species may be due to seasonal causes. Mr. G. C. Dudgeon has observed that the green form occurs in March and the brown form from August to September” (de Nicéville, Sikkim Gaz. (1894), 146). We possess a pale-coloured male of the brown form from Bhotan, taken by Mr. Dudgeon. Mr. de Nicéville records specimens of both the white and brown forms from Khurda in Orissa, Tenasserim, Andamans, and Perak (Butt. Ind. ii. 254). Numerous specimens of both forms have been received by Col. C. Swinhoe from the Khasias. The type specimen is recorded, by Fabricius, from Siam, and is still in the Banksian Cabinet in the British Museum. Mr. P. Crowley possesses a male of the brown form identical with the type, also from Siam, and a pale-coloured male of the brown form from Shillong. Col. C. H. E. Adamson obtained the pale form “near Moulmein, on the Hlinebwe River; but rare; in August and February” (List, 1897, 26), and says, *in epistola*, “that when flying it may be mistaken for *Junonia Atlites*, which was exceedingly common at the same place.” Dr. N. Manders obtained the pale form in Eastern Karenee, Burma (Tr. Ent. Soc. 1890, 525). A male and female of both forms from the Andamans and Perak are in Mr. P. Crowley’s collection. A female of the pale form from Salanga Island is in the British Museum. We possess a female of the pale form from Hainan. In the numerous specimens of both the wet and dry-season forms we have under examination we observe various degrees of shades in the intensity of the colour of the basal and marginal area and markings, which evidently show a gradational mergence from one form to the other.

Of our illustrations of this species on Plate 308, figs. 1, 1a, b represent a male and female of the *wet-season* form from the Khasia Hills, identical with the Fabrician type of *Cocles* in the British Museum, and figs. 1c, d, e, a male and female of the *dry-season* form; fig. 1c, being a Burmese male, and fig. 1d, e, an Andaman female.

APSITHRA PERIANDER (Plate 308, fig. 2, 2a, ♂ ♀).

Papilio Periander, Fabricius, Mant. Ins. ii. p. 9 (1787); Ent. Syst. iii. i. p. 67 (1793). Donovan, Ins. India, pl. 37, fig. 1 (1800).

Cyrestis Periander, Westwood, Gen. D. Lep. p. 261 (1850). Butler, Catal. Fabr. Lep. B. M. p. 82 (1869). de Nicéville, Butt of India, etc., ii. p. 255 (1886). Distant, Rhop. Malay. p. 443, pl. 41, fig. 10.

Cyrestis Themire, Honrath, Berl. Ent. Zeit. 1884, p. 398, pl. 10, fig. 5. Moore, Journ. Linn. Soc. Zool. 1886, p. 35.

Cyrestis Wernickei, Staudinger, Exot. Schmett. p. 133 (1888).

IMAGO.—Male and female. Upperside white; basal interspaces, to the medial band, sullied with pale fuliginous-grey scales. *Forewing* crossed by a subbasal, a medial, and a discal narrow pale dull ochreous somewhat irregular band; a short similar coloured streak across base of the cell, another across its middle, and one beyond the discocellulars ending on the middle median veinlet; a broad fuliginous-grey outer marginal band, widest anteriorly, its inner edge obtusely angulated inward below the apex and irregularly waved hindward, bearing a submarginal fine whitish lunular line marked within by a series of obscure small black round spots, followed by a marginal fine black line defined on each side by an equally fine white line; the costal border slightly fuliginous-grey. *Hindwing* crossed by three narrow pale brighter ochreous bands and a lower outer-discal broad bright ochreous irregular band, extending from above the median to above anal angle; a short ochreous streak across end of the cell; a narrow fuliginous-grey outer marginal band bearing a submarginal slender black and white parallel scalloped line, marked within by a series of black lunate spots which are narrowly surrounded by white; the black spot above anal lobe being diffusedly speckled; beyond is a marginal slender black line defined on each side by an equally fine white line. Underside marked as above, but all the inner bands slightly narrower and less distinct. *Body*, palpi, and legs white; antennæ brown, annulated with white beneath, tip ochreous.

Expanse, ♂ ♀ $1\frac{5}{10}$ to $1\frac{9}{10}$ inch.

HABITAT.—Siam; Tenasserim; Malay Peninsula; Penang; Sumatra.

DISTRIBUTION.—The Fabrician type, in the British Museum Collection, is recorded from Siam. An example from Siam is also in Mr. P. Crowley's collection. Capt. C. T. Bingham took it in the Thoungyeen Valley, Upper Tenasserim, in November, and Col. C. H. E. Adamson obtained it in the "Houngtharaw Valley, in December and January," where he says, "it was very plentiful on a particular stream rushing down from a high plateau to the valley" (Note). Dr. J. Anderson took it on King Island in February and on Elphinstone Island, Mergui Archipelago, in March (J. Linn. Soc. Zool. 1886, 35). Mr. W. L. Distant records it from Perak, Malay Peninsula, and Penang.

Of our illustrations of this species on Plate 308, fig. 2 represents a male from Hougtharaw, and fig. 2a a female from Siam—identical with the Fabrician type.

INDO-MALAYAN SPECIES.—*Apsithra Sericeus* (Cyr. Sericeus, Butler, P. Z. S. 1865, p. 482. *Habitat*. N. Borneo.—*Apsithra Cassander* (Cyr. Cassander, Felder, Wien. Ent. Monats. 1863, p. 108. Semper, Reis. Phil. Lep. pl. 21, fig. 1, 2. *Habitat*. Phil. Isles.—*Apsithra Horsfieldii* (Pap. Periander, Horsf. Catal. Lep. E. I. C. pl. V, fig. 3, 3a (1829). Male and female. Upperside with the inner transverse bands comparatively broader than in typical *Periander*; the outer marginal band on the forewing not inwardly angulated below the apex, and its inner edge more regular in its course. Underside with the marginal band ill-defined. Expanse, ♂ ♀ $1\frac{6}{10}$ to $1\frac{7}{10}$ inch. *Habitat*. Java.—*Apsithra Dohertyi*. Male and female. Upperside with the transverse bands narrow, but more irregular than in *Horsfieldii* or *Periander*; the outer marginal band on forewing broader and regularly sinuous on its inner edge; the outer marginal band on hindwing also broader, and its inner series of black spots much larger and cordate in shape. Expanse, ♂ ♀ $1\frac{8}{10}$ to 2 inches. *Habitat*. Sambawa (Coll. Crowley and Grose-Smith).

Genus JUNONIA.

Junonia, Hübner, Verz. bek. Schmett. p. 34 (1816). Doubleday and Hewits. Gen. D. Lep. i. p. 206 (1849). Felder, Neues Lep. p. 13 (1861). Moore, Lep. Ceylon, i. p. 40 (1881). de Nicéville, Butt. of India, etc., ii. p. 65 (1886). Scudder, Butt. E. U. S. i. p. 487 (1889). Distant, Rhop. Malay. p. 92 (1883). Staudinger and Schätz, Exot. Schmett. ii. p. 125 (1887).

Alcyoneis, Hübner, Verz. bek. Schmett. p. 35 (1816).

Aresta (part), Dalm. in Billberg's Enum. Ins. p. 79 (1820).

Precis, Moore, Lep. Ceylon, i. p. 39. Distant, Rhop. Malay. p. 89. de Nicéville, Butt. India, etc., ii. p. 63 (*nec* Hübner *).

IMAGO.—Male. Wings short, broad. *Forewing* triangular; costa much arched from near the base, apex obtuse; exterior margin oblique, slightly uneven, obtusely angulated outward at end of upper radial, slightly concave below the angle and again obtusely angulated at end of lower median, posterior angle rounded; posterior margin nearly straight; costal vein extending to middle of margin; first and second subcostal branches emitted close together a little before end of the cell, third branch at fully one-third beyond the cell and extending to apex, fourth and fifth at two-thirds beyond; cell area short, broad, open; upper discocellular very short and outwardly oblique, second discocellular deeply concave; two upper median branches emitted beyond the opposite discocellulars; submedian vein straight. *Hindwing*

* The type of Hübner's genus *Precis* is *Octavia*, Cramer, an African species, in which the cell of the forewing is closed.

with the costa broadly lobate at base and obliquely curved outward; exterior margin obliquely convex, slightly scalloped; anal angle somewhat lobate; precostal vein bent outward and slightly bifid at the angle; costal vein much curved from the base and extending to apex; cell area short, open. *Body* rather stout; palpi porrect, second joint stout, extending half beyond head; third joint short, conically slender, pointed, clothed with laxly appressed scales at sides and beneath, second joint hairy above; forelegs of male rather short, slender, clothed with scales and delicate hairs; forelegs of female smoothly scaled, tarsus flattened at the sides, joints laterally spined at the tip; antennæ slender, with a rather short, stout, somewhat spatulate grooved club; eyes naked.

TYPE.—*J. Lavinia*.

LARVA.—(*Iphita*) "Cylindrical; slightly pubescent; armed with nine longitudinal rows of many-branched spines, except on the head, which is clothed with short bristles. In *J. Iphita* the spines appear to be shorter and more closely set than in the other Indian species. They feed, as a rule, on *Acanthaceæ*."

PUPA.—"Regular, with three, or five, dorsal rows of small tubercular points. Suspended perpendicularly" (*J. Davidson* and *E. H. Aitken*, *J. Bombay N. H. Soc.* 1890, 271).

HABITS, ETC.—"In India the species of *Junonia* occur everywhere up to about 7000 feet elevation, and are generally numerous in individuals. They have a rapid flight, but seldom go far before settling, which they do with expanded wings, often on the bare ground, frequently on flowers. *J. Hierta* and *J. Orithya* delight in the stony beds of dried-up streams in the Hills; in the Plains they chiefly frequent fields and gardens. The sexes are very slightly differentiated" (*L. de Nicéville*, *l.c.* p. 66).

SEASONAL DIMORPHISM.—This occurs to a slight extent in *J. Iphita*, *Atlites*, and *Lemonias*, the wet-season brood of the two former species being distinguishable from the specimens of the dry-season brood, by the brighter and darker ground-colour and more prominent markings of both the upper and underside of the wings, and in the latter species (*Lemonias*) the dry-season specimens are distinguishable from the wet-season by the paler or uniform colour of the whole underside and the absence of the ocelli on the hindwings. In *J. Almanas*, the wet-season brood (*Asterie*) not only differs from the dry-season (*Almana*) in the ground-colour and markings of the underside, but also—in the regions where the seasons are well separated—in the shape of the marginal outline of both wings.

In *J. Hierta* and *Orithya*, in addition to the difference in the ground-colour and markings on the underside, the females of both species also have the markings of the upperside somewhat different from those of the males.

ABERRATIONS OR "SPORTS."—The butterfly described by *Möschler* as *Junonia*

Hopfferi, from Silhet, is evidently an aberration, but without comparison of the type specimen we cannot say to which species it belongs. We describe an aberration of the male of *J. Atlites*, from Cachar, in the possession of Mr. P. Crowley. Of *J. Lemonias*, Col. C. H. E. Adamson records a "sport" caught by himself in September, in Burma; and Mr. L. de Nicéville records two specimens of a "sport" of this species, both females, taken in Malda and Orissa, in Bengal.

JUNONIA IPHITA (Plate 309, fig. 1, 1a, b, c, d, e, ♂ ♀ (*Wet and Dry-season forms*)).

Papilio Iphita, Cramer, Pap. Exot. iii. pl. 209, fig. C.D. (1779). Fabricius, Spec. Ins. ii. p. 86 (1781).

Precis Iphita, Doubleday and Hewits. Gen. D. Lep. p. 210 (1849). Moore, Lep. Ceylon, i. p. 39, pl. 21, fig. 1, 1a, b (1881). Distant, Rhop. Malay. p. 90, pl. 11, fig. 5, ♂, pl. 9, fig. 5, ♀ (1882). de Nicéville, Butt. of India, etc., ii. p. 63, pl. 19, fig. 84, ♂ (1886). Leech, Butt. of China, etc., i. p. 276 (1893).

Junonia Iphita, Butler, Catal. Fabr. Lep. B. M. p. 76 (1869).

IMAGO.—*Wet-season form*. Male and female. Upperside olivescence-brown; cilia slightly edged alternately with white. Both wings with the basal half darker brown, the divisional border across the disc more intensely defined and blackish, being also angulated outward from the costa of forewing to the upper median, and thence slightly waved posteriorly and more evenly across the hindwing; a dark outer-discal fascia traversed on the forewing by two, or three, very obscure or obsolescent small ocellated spots situated in the median interspaces, and on the hindwing by a series of five somewhat more distinct similar ocellate spots; followed by a submarginal and marginal dark lunular line; all these spots being less defined in the female. *Forewing* also with two slender sinuous black lines across middle of the cell, two similar discocellular lines, and a white subcostal dot before the apex. *Hindwing* also with two similar discocellular lines. Underside dark purplish-brown washed with chalybeate-grey between the markings. *Forewing* crossed by a basal, subbasal, and two medial, more or less-defined, darker purplish-brown sinuous-edged fasciæ; followed by a submarginal similar diffused decreasing fascia, which is outwardly-bordered by a recurved series of, more or less apparent, small obscure ocellate spots with white centres, and beyond by two obscure outer marginal sinuous lines. *Hindwing* crossed by a subbasal broad irregular sinuous purplish-brown fascia, a medial fascia which is diffused and bordered outwardly by a series of more or less obscure small yellowish-ochreous ocellate spots with white central dot, and bordered inwardly by a nearly straight black line edged by an obscure yellowish-ochreous line, and sometimes showing a pale yellowish patch at its costal end; followed by an inner marginal black sinuous line edged with grey. *Body* and palpi,



1.



1^a



2



2^b



2^a



2^c



2^d



2^e



1.



1^b



1^a



1^c



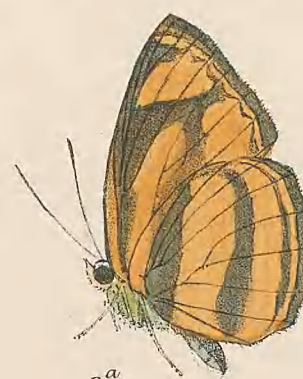
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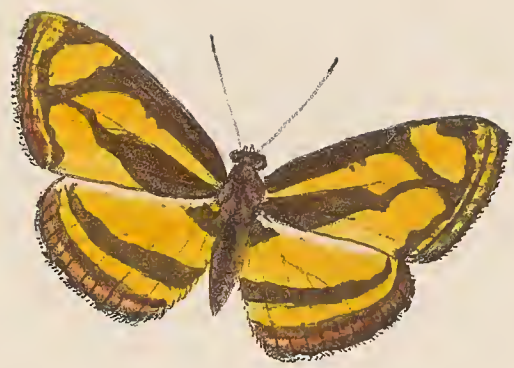
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2



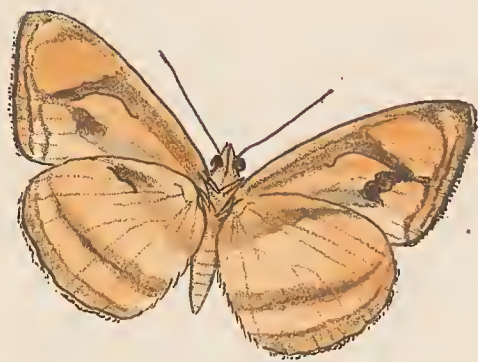
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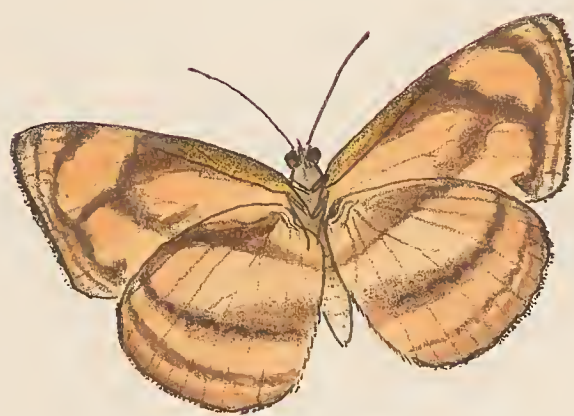
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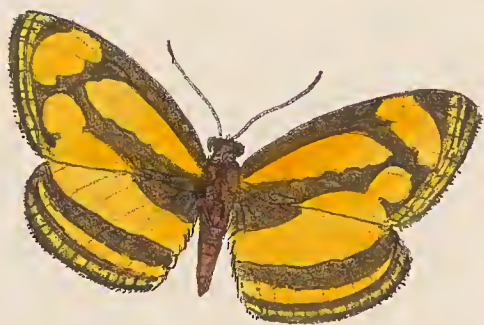
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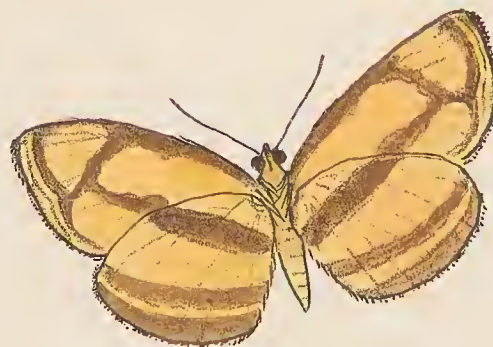
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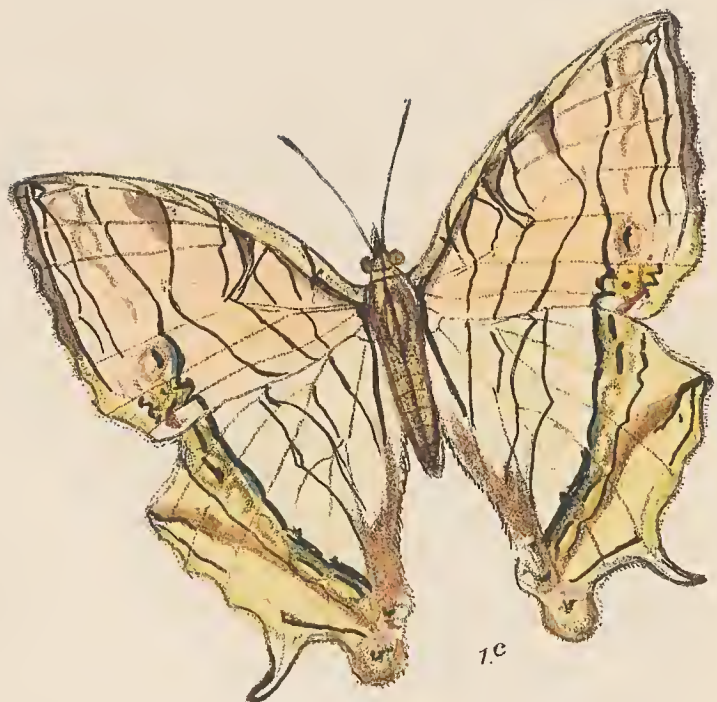
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2



2a





1.



1a



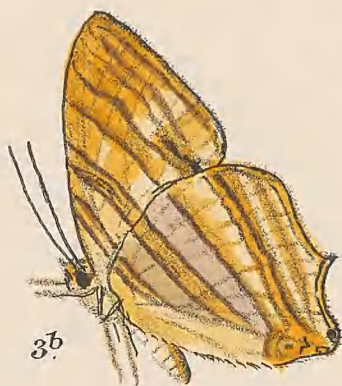
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3.



3b



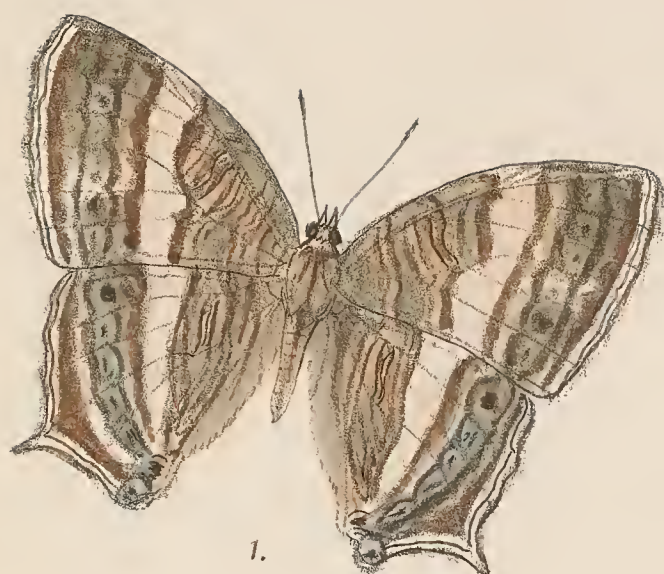
3a



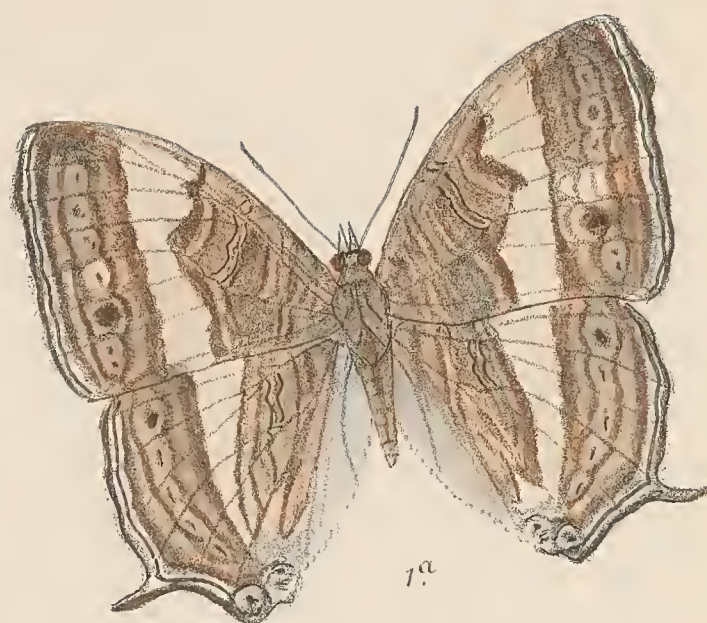
4a



4.



1.



1^a



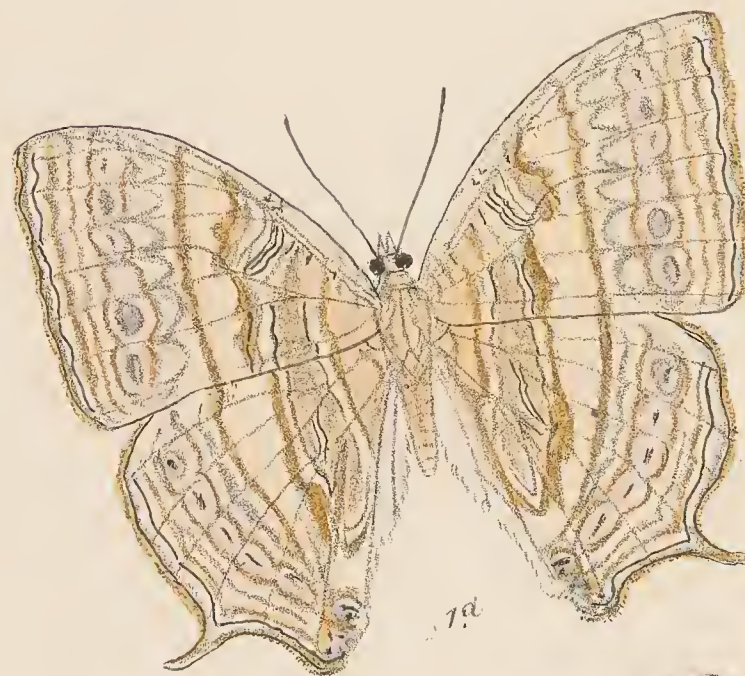
1^b



1^c



1^d



1^e



2



2^a

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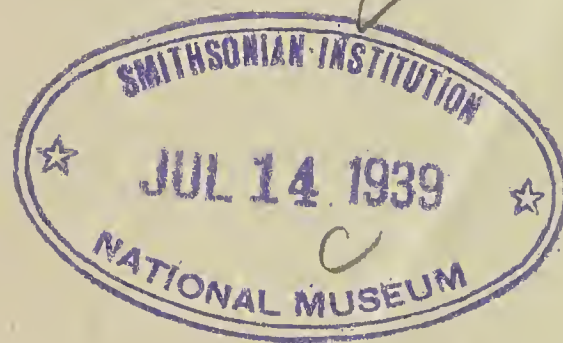
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and legs, olivescence-brown, palest beneath, antennæ black above, pale ochreous beneath.

Dry-season form. Male and female. Upperside darker olivescence-brown, markings the same; the series of ocelli on the hindwing more prominent, and more or less ochreous-ringed, most distinctly so in the female. Underside the same.

Expanse, ♂ 2 to $2\frac{4}{10}$, ♀ $2\frac{4}{10}$ to 3 inches.

LARVA.—Cylindrical; dark brown; head reddish-ochreous; segments with dorsal and lateral rows of short delicate branched-spines. Feeds on *Strobilanthus*.

PUPA.—Short; pale purplish-grey or fuliginous; with dorsal rows of small tubercular points; thorax broad; head-piece pointed in front.

HABITAT.—India; Ceylon; Burma; Tenasserim; Malay Peninsula; Sumatra; W. and C. China.

DISTRIBUTION AND HABITS.—“This is an exceedingly common species, as a rule, where it occurs; it has a somewhat bold flight, but not for any great distance, it often, but not always, pitches on the ground, frequently on bushes. It occurs throughout the Himalayas, in Assam, Silhet, Cachar, Burma, rarely in Calcutta, but commonly in the Wynaad, Nilgiris, and Ceylon. In the plains of Upper India it is seldom found, and never in the drier parts” (de Nicéville, Butt. India, ii. 64). It is also found in Tenasserim, the Malay Peninsula, and Sumatra. In the W. Himalayas it is “common all the summer and autumn in the beds of streams, and occasionally met with on Hill-tops far away from any water” (de Nicéville, Indian Agriculturist, 1880). “Taken at Simla, Masuri, and Kashmir, June to October” (Capt. H. B. Hellard, Notes). “In Kumaon it is everywhere common, as high up as Khati, 8000 feet elevation. The *wet-season* brood consists of very pale specimens; the autumn brood, appearing at the end of September, is much darker” (W. Doherty, J. A. S. Bengal, 1886, 123). “In the Bombay Presidency this butterfly is very plentiful after the rains, and especially among the thorny jungle which covers the little Hills of the Konkan. It is also one of the most familiar species of the Ghâts. I have never seen specimens here so large as some which come from the Himalayas. It has all the habits of a *Junonia*, and its colour seems inappropriate, for it lives in the midst of green foliage, and rarely settles on the ground” (E. T. Aitken, J. Bombay N. H. S. 1895, 406). “In the larva of *Iphita* the spines seem to be shorter and more closely set than in other *Junonias*, the colour is dark dull brown. It feeds on the Karvi (*Strobilanthus*) and doubtless occurs more or less throughout the year. We found few larvæ, for though the butterfly is the commonest in Karwar, the plant is still commoner, an unfavourable condition for the larva hunter” (J. Davidson and E. T. Aitken, *id.* 1890, 271). “Very common in the low country of Travancore, and in the Hills up to 3000 feet elevation” (H. S. Ferguson, Journ. Bombay N. H. S. 1891, 8). “This is one of the commonest butterflies occurring in

Sikkim, and is found up to about 8000 feet elevation almost throughout the year. The larva, in Sikkim, feeds on a species of *Strobilanthus*" (L. de Nicéville, Sikk. Gaz. 1894, 135). Col. C. H. E. Adamson records it as being found "throughout Burma" (List, 1897, p. 18). Dr. J. Anderson took it in the Mergui Archipelago in November, December, January, and March (Journ. Linn. Soc. Zool. 1886, 35). We possess specimens from Western China.

FOOD-PLANT OF LARVA.—"The larva feeds on the Karvi, *Strobilanthus callosus*, at Karwar, Bombay" (Davidson and Aitken, J. Bombay N. H. S. 1890, 71).

JUNONIA HOPFFERI.

Precis Hopfferi, Möschler, Stett. Ent. Zeit. 1872, p. 337, ♀.

Junonia Hopfferi, de Nicéville, Butt. India, etc., ii. p. 71 (1886).

"The shape of the forewing resembles that of *Precis Erigone*, but the hindwing is not angled as in several species of the genus. The ground-colour of both wings on the upperside is of a clear golden-brown, as in many females of *P. Iphita*, Cram. [*ida*, Cram.], but is shaded by a dark brown dusting, so that it [the ground-colour] only appears in a triangular spot at the base of the discoidal cell, in a narrow transverse spot at end of the cell, in a narrow band behind the transverse series of dark spots which crosses the middle of the wings, and in a broader band in front of the margin. In the discoidal cell in front of the middle are two obliquely-placed round dark brown spots with clear golden-brown centres; behind these is a large misshapen kidney-like spot surrounded with black. In the middle of the wings the dark dusting is bounded by a series of dark brown transverse spots which enter angularly into the fourth cell. In front of the light margin is placed a series of black-brown round spots, of which the three upper ones in the fifth, sixth, and eighth cells are only brown on the innerside, being otherwise white, and of these the spot in the fifth cell approaches the margin, thereby dropping out of the line of the others; the lowest spot in the second cell is the largest, and surrounded with a fine golden-brown. Behind these spots runs through all the cells a series of broad lunular spots, and behind them this again runs a dark brown undulating streak following the margin which runs in an angle into the fifth cell. The margin is narrowly black-brown in colour, but marked finely with white externally between the veins. On the underside the colouring is clearer, brownish ochre-gold, the light parts being almost reddish-gold; the spots of the cell are encircled with fine black, the series of dark spots through the middle of the wings lighter brown and less distinct on the margin are bordered with white violet-red spots on the forewing in cells one *b* and two, also in cells five and six, and in the hindwing in all the cells. The dark bands of the

upperside between these spots and the clear margin appear narrower in the forewing, almost resolved into flecks; of the round spots immediately behind these the one in the second cell is black bordered, those in the fourth, fifth, sixth and eighth cells are white bordered, and only the three lowest on the underside are bordered with faint brown, the spot in the third cell is a mere point. On the hindwing this band is still more disintegrated, and of the dark spots only the one in the second cell is visible; it is deep black, on the side towards the margin, with a fine white centre. The series of lunulated spots, as also the undulating streak in front of the margin, is a lighter reddish-brown, the border between the two on the forewing in cells five and one *b*, and the hindwing in all the cells being tinged with pale violet-red. The margin itself is scarcely darker. Two females from Silhet" (*Möschler, l.c.*).

HABITAT.—Silhet.

NOTE.—The above probably refers to an aberration or "sport" of one of the species of this genus.

JUNONIA ATLITES (Plate 310, fig. 1, 1a, b, c, d, ♂ ♀; larva and pupa).

- Papilio Atlites*, Linnæus, Cent. Ins. p. 24 (1763). Johanssen, Amæn. Acad. vi. p. 407 (1764). Linn. Mus. Ulr. p. 273 (1764).
Junonia Atlites, Kirby, Trans. Ent. Soc. 1870, p. 145. Aurivillius, Kongl. S. V. Akad. Handl. xix. p. 79 (1882). Distant, Rhop. Malay. p. 93, pl. 2, fig. 11, 12, ♂ ♀ (1882). de Nicéville, Butt. of India, etc., ii. p. 69 (1886).
Papilio Laodamia, Clerck, Icon. Ins. iii. pl. 7, fig. 5 (*ined.*).
Papilio Laomedea, Linnæus, Syst. Nat. xii. ed. ii. p. 772 (1767). Drury, Illust. Exot. Ins. i. p. 12, pl. 5, fig. 3 (1770). Cramer, Pap. Exot. i. p. 13, pl. 8, fig. F, G (1775). Sulzer, Gesch. Ins. p. 144, pl. 16, fig. 10 (1776). Herbst, Nat. Schmett. vii. pl. 174, fig. 1, 2 (1794).
Junonia Laomedea, Kirby, Catal. D. Lep. p. 187 (1871). Moore, Catal. Lep. Mus. E. I. C. i. p. 140, pl. 5, fig. 4, 4a, larva and pupa (1857). Butler, Catal. Fabr. Lep. B. M. p. 77 (1869).
Precis Laomedea, Moore, Lep. Ceylon, i. p. 40, pl. 21, fig. 2 (1881).

IMAGO.—Male. Upperside lilacine brownish-grey, the outer borders greyish-fuliginous. Forewing with two irregular sinuous black lines across middle of the cell, and two similar lines bordering the discocellulars, a transverse discal irregularly-angulated more or less slightly diffused black line, followed by a recurved series of six ocellated spots ringed with white and black, of which the upper two and the fifth are the largest, and are transversely centred inwardly with ochreous-red and outwardly with black, the others with blackish centre; the first ocellus is preceded by a small bifurcated white spot at the base of fourth and fifth subcostals; beyond is a submarginal and marginal somewhat diffused blackish lunular line. Hindwing with two waved black lines crossing end of the cell, a transverse discal waved black

line, followed by a series of five similar ocellated spots, a sixth or lowest spot sometimes also obsolescently present, the two upper and the fifth the largest and with red and black centres; beyond is a submarginal and marginal somewhat diffused blackish lunular line. Underside lilacine ochreous-white, the outer borders slightly tinged with pale ochreous; the basal and outer markings as on upperside, but very slender and faintly defined; the discal line sinuous on the forewing and more or less regularly straight on the hindwing; the two largest particoloured ocelli on both wings slightly defined and paler ochreous, or obsolescent. *Forewing* also with an extra basal faint line across the cell, the other cell lines extending faintly hindward to across cell of the hindwing and partly beyond its median vein.

Female. Upperside darker; the transverse lines somewhat more diffused, the ocellate spots brighter, with the interspaces bordering the discal and submarginal line more or less lunularly whitish, mostly more defined on the forewing. Underside pale dull yellowish or brownish-ochreous, darkest alternately between the markings and on outer borders; markings as in underside of male, but more distinct. *Body* and palpi above fuliginous-grey, beneath and legs greyish-white; antennæ black above, ochreous beneath and outwardly edged with white, tip ochreous.

Expanse, ♂ ♀ $2\frac{4}{10}$ to $2\frac{8}{10}$ inches.

LARVA.—Cylindrical; armed with a dorsal and lateral rows of branched-spines. Colour fuliginous-black, with a paler subdorsal line, and a sublateral ochreous-brown line; spines black.

PUPA.—Rather stout; purplish-grey; head-piece broadly obtuse in front and slightly cleft; thorax and abdomen with a dorsal row of acute tubercular points and lesser lateral points.

HABITAT.—Plains of Eastern and Peninsular India; Assam; Ceylon; Nicobars; Burma; Tenasserim; Malay Peninsula, etc.

ABERRATION.—A male, from Silchar, Cachar, in Mr. P. Crowley's collection, has the upperside dusky greyish-fuliginous, broadly darkest on the costal border of forewing and anteriorly on the hindwing. Both wings with the ordinary transverse discal sinuous line absent, the two submarginal lines united, and forming an ill-defined submarginal dusky fascia. On the forewing the interspaces of the two pairs of sinuous cell-streaks is fuliginous-grey, the outer-discal transverse row of ordinary ocelli obsolescent and without any indication of ochreous interiors; on the hindwing these ocelli are present but ill-defined, and slightly show the ochreous centres. On the underside the ground-colour is of the ordinary pale lilacine ochreous-white, the discal and outer line slightly indicated, but diffused, the ocelli also very slightly indicated, the basal transverse lines indicated by fuliginous-brown scaled inner and outer interspaces.

DISTRIBUTION.—“This is a very common species, seldom if ever occurring in the Himalayas, or in the very dry portions of India, but abundant in the plains throughout the area of heavy rainfall. Colonel Swinhoe does not record it from Bombay and the Deccan” (de Nicéville, Butt. Ind. ii. 69). We possess specimens from Nepal; Sikkim; Bhotan; Chittagong, taken in November; Yaw, Burma, taken in October; Mandalay; Bhamo, taken in November by Signor L. Fea; Tavoy; Tenasserim; Ceylon; Camorta, Nicobars; Malacca; Sumatra; Nias; Java; Sarawak, Borneo; Hainan. Mr. W. Doherty records it as “scarce at Ranibagh and in the Tarai, Kumaon, from 1000 up to 2000 feet elevation” (J. A. S. Beng. 1886, 123). “It occurs rarely in Sikkim in the hottest valleys, but is common in the Terai at all seasons” (H. J. Elwes, Tr. Ent. Soc. 1888, 342).

“In the Central Provinces this butterfly is always found in and about marshy spots, on the borders of streams and damp places generally. The flight is distinctly slower than any of its relatives, so that there is no difficulty in capturing it” (J. A. Beetham, J. Bombay N. H. S. 1890, 279). “It is fairly common on the Kanara coast about rice-fields, chiefly at the end of the rains. It occurs also above the Ghauts. The larva is coloured more distinctively than the others, being dull smoky black with a well-defined orange-brown stripe above the legs. The pupa is of a uniform slaty colour” (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 249). Colonel C. H. E. Adamson records it as “very common in Lower Burma, but comparatively scarce in the dry parts of Upper Burma” (List, 1897, 19). Dr. J. Anderson found it “very common in Mergui, Tenasserim, in December, January, February, and March” (J. Linn. Soc. Zool. 1886, 35). Mr. H. Druce records it from “Chentaboon and Nakonchaisee, Siam” (P. Z. S. 1874, 105). Mr. J. J. Walker states having “seen one or two specimens in local collections in Hong Kong, said to have been taken there, but did not meet with it himself” (Tr. Ent. Soc. 1895, 453).

JUNONIA ORITHYA (Plate 311, fig. 1, 1a, b, c, d, e, ♂ ♀; larva and pupa).

Papilio Orithya, Linnæus, Syst. Nat. ed. x. p. 473 (1758); *id.* ed. xii. p. 770 (1767). Cramer, Pap. Exot. i. pl. 19, fig. C, D, ♀, pl. 32, fig. E, F, ♂ (1775); *id.* iv. pl. 290, fig. A, B, ♂ (1780). Herbst, Nat. Schmett. pl. 177, fig. 5, 6, 7, ♂ ♀ (1794). Donovan, Ins. China, p. 64, pl. 35, fig. 2, ♀ (1842).

Vanessa Orithya, Lucas, Lep. Exot. p. 113, p. 60, fig. 1 (1845).

Junonia Orithya, Hübner, Verz. p. 34 (1816). Butler, Catal. Fabr. Lep. B. M. p. 73 (1869). Moore, Lep. Ceylon, i. p. 41, pl. 22, fig. 1, 1a, b, ♂ ♀, larva and pupa (1881).

Junonia Orithya, Doubleday and Hewits. Gen. D. Lep. i. p. 209 (1849). Moore, Catal. Lep. Mus. E. I. C. i. p. 141, pl. 5, fig. 5, 5a (1857). Forsayeth, Trans. Ent. Soc. 1884, p. 382. Butler, Ann. Nat. Hist. 1885, p. 308. de Nicéville, Butt. India, etc., ii. p. 73 (1886).

Junonia Ocyale et Isocratia, Hübner, Verz. p. 34 (1816).

Junonia Swinhoei, Butler, Ann. Nat. Hist. 1885, p. 309.

IMAGO.—Male. Upperside. *Forewing* with the costal border whitish-edged, cilia alternately pale brown and white; the basal two-thirds dark blue-black, the outer area fuliginous-black; an ochreous-white oblique subapical short angulated band and two transverse submarginal lunular fasciæ, the inner fascia broadest, shortest, and bearing an upper and a lower small black red-ringed ocellus, with a blue-speckled central dot, below which the posterior area is dark blue; crossing end of the cell are two short very obsolescent blue-scaled bars. *Hindwing* dark blue suffused with purple; a basal short narrow black angular patch which curves upward across end of the cell, and merges into brown on the abdominal margin; two outer-discal prominent ocelli, which in some specimens are of equal size, in others the upper one is the largest, and is either entirely black and blind, or obsolescently red-ringed, the lower one being bright red-ringed, with blue and black speckled centre; beyond are two submarginal pale-bordered slender black lunular lines; cilia mostly white. Underside pale dull greyish-ochreous. *Forewing* with three basal transverse reddish-ochreous bands sinuously edged with black, a discal sinuous fascia inwardly edging the subapical band, followed by the pale less-defined outer marginal lunular fasciæ and the two blind ocelli, as on upperside. *Hindwing* crossed by narrow more or less faintly-defined brown sinuous basal and marginal lines, and a diffused brownish discal fascia bearing a series of small very palely-defined or obsolescent ocelli.

Female. Upperside. *Forewing* with the basal and outer margin browner black, the blue patch duller, and sometimes fuliginous; the white markings somewhat wider, the ocelli larger and more prominent; two more or less obsolescent black-edged reddish bars with intervening bluish bar across end of the cell. *Hindwing* with the basal half entirely black, the blue outer area paler, duller, and sometimes fuliginous; the two ocelli larger, more prominent, and both red-ringed; marginal pale-bordered lines also more defined. Underside darker than male; markings the same, but all more defined. *Body* above black, beneath and legs pale ochreous-white; palpi above brown, white beneath; antennæ white above, beneath ochreous annulated with white, tip beneath brown.

Expanse, ♂ $1\frac{5}{10}$ to 2, ♀ $1\frac{5}{10}$ to $2\frac{4}{10}$ inches.

LARVA.—“Head bifurcated; reddish spot in centre of face, a small spinous process on each upper angle of eye. Head and body dark shining black, shading into brown when seen by reflected light. Head on a short neck, the latter of an orange-colour for a short distance; caudal extremity also tipped with orange. Body covered with perpendicular spines armed with strong radial hairs.”

PUPA.—“Suspended by tail; wing covers of a muddy-yellow; rest of body of

a purplish colour, variegated by lines of a dull creamy-white; slight angular projections along abdomen" (Dr. Forsayeth, *l.c.*).

HABITAT.—India; Ceylon; Burma; China; Hong Kong; Formosa.

DISTRIBUTION, HABITS, ETC.—"This is a common species and appears to occur everywhere in India up to about 6000 feet elevation. It is exceedingly variable on the underside, specimens from the dry north-west being of a pale stone-grey, while examples from Shillong, Assam, have the underside dark brown, richly mottled and shaded with paler brown. On the upperside, too, there are variations in markings, some males show traces of two ochreous bands across the cell of the forewing, which are usually more or less present in the female, in some specimens of the latter sex that feature being very prominent. The ocelli vary greatly in size in both sexes, in some specimens they are fully twice as large as in others. The specimens from Upper Burma, Cachar, and Assam are richly marked on the underside, and are almost identical with the typical *J. Orithya* from China, which Mr. Butler has already shown (Ann. N. H. 1885, 308) to extend to Siam. The Western form with the pale, slightly marked underside, has been separated as a distinct local race as *J. Swinhoei* (Butler, *l.c.*). This variety is fairly constant throughout the dry tracts in the West and North-west, and also in the Western Himalayas, but there is no line of demarcation, and the two forms gradually merge into each other. Specimens from Ceylon and Travancore are nearly as richly marked as those from Cachar; those from Sikkim and Bhotan, and also from the Western Ghâts are less richly marked; and those from the plains of Bengal and the Coromandel coast still less so; the differences as in all parallel cases following the tropical distribution of the rainfall, the colours being most intense where the rainfall is heaviest" (de Nicéville, Butt. Ind. ii. 74). "Found in Kumaon, both in the plains and up to 6000 feet elevation" (W. Doherty, J. A. S. Bengal, 1886, 123). "Generally seen in company with *J. Hierta*; it also closely resembles it in habits and time of appearance. Both are to be met with on the wing in the Hills from March to November" (L. de Nicéville, Indian Agriculturist, January, 1880). "Partial to bare grass land; to be seen in the hottest hot winds, and in the bleak wintry weather, pitched on the grass, flitting quickly away and pitching again after a short circuit. Larva reared on *Antirrhinum*" (Captain A. M. Lang, Notes). Colonel C. Swinhoe records its capture at "Quetta, Beluchistan, in September" (Tr. Ent. Soc. 1885, 339). Colonel J. W. Yerbury took it at "Campbellpore, forty miles from Rawul Pindi, in April, at Attock in April, and at Bugnoter in September. It is probably the commonest butterfly all the year round both at Campbellpore and Murree, but at Thundiani Hill Station, 8700 feet elevation, it is uncommon" (Ann. N. H. 1888, 142). "Commonly found in ditches all the year round in Bombay and the Deccan. I have taken it at Karachi in May" (Colonel C. Swinhoe, P. Z. S. 1885, 128). Dr. Forsayeth

describes the larva, as reared by him in Mhow, in August (Tr. Ent. Soc. 1884, 382). "This butterfly is of similar habits to *J. Hierta* and *J. Lemonias*. They all love the hot sunshine, and this and *J. Hierta* are to be found in the Central Province in the most open and exposed situations; open grass plains being about the most favourite spots" (J. A. Beetham, J. Bombay N. H. S. 1890, 279). "This is *par excellence* the *Junonia* of the Deccan, delighting in dry hills and stony plains. On the bare plateau of Lanowlia I have found it very abundant in company with *J. Hierta*, in February, revelling in the wealth of minute wild flowers which clothe the ground in that favoured spot" (E. H. Aitken, J. Bombay N. H. S. 1886, 131). "This species likes stony plains and bare hills, and is consequently comparatively rare in Kanara, and altogether wanting during the monsoon. It rests always on the ground" (J. Davidson and E. H. Aitken, *id.* 1896, 249). "Very common on the Eastern Coast, and found everywhere. Larva easily observed, as it feeds on the low and slightly aromatic shrubs which grow by the wayside in the Karnatic" (S. N. Ward, MS. Notes). In Ceylon, Mr. F. M. Mackwood records it as "occurring everywhere, but plentiful only from 2000 to 4000 feet elevation; a favourite resort being the Patenas, and particularly on the pathways or bare places in them." Captain Hutchison says it is "found at all times in the Western and Central Provinces, both in the plains and up to 3000 feet, in cultivated and open waste-ground. Flight rather quick; settles on the ground and seems partial to hot dusty and sandy spots. Dr. Thwaites found the larva feeding on *Acanthads*" (Lep. Ceylon, i. p. 42).

"A common insect in Sikkim at elevations up to 9000 or 10,000 feet, but most abundant in cultivated ground and sunny clearings. It settles on the ground with open wings, and has a rapid strong flight. Occurs at all seasons" (H. J. Elwes, Tr. Ent. Soc. 1888, 342). "Common throughout Burma, alike in the hot plains, in the marshes in the South, and the hills in the North and West" (Colonel C. H. E. Adamson, List, 1897, 19).

JUNONIA HIERTA (Plate 312, fig. 1, *larva* and *pupa*, fig. 1a, b, c, d, e, ♂ ♀).

Papilio Hierta, Fabricius, Ent. Syst. Suppl. p. 424 (1798).

Junonia Hierta, Kirby, Syn. Catal. D. Lep. p. 648 (1871). Swinhoe, Proc. Zool. Soc. 1884, p. 505; *id.* 1885, p. 128. de Nicéville, Butt. of India, etc., ii. p. 71, pl. 20, fig. 94, ♂ ♀ (1886).

Papilio Oenone, Cramer, Pap. Exot. i. pl. 35, fig. A, B, C, ♂ ♀ (1775). Herbst, Nat. Schmett. vii. p. 163, pl. 178, fig. 1-4 (1794). Donovan, Ins. China, p. 66, pl. 36, fig. 1, ♂ (1798), *nec* Linn.

Junonia Oenone, Hübner, Verz. bek. Schmett. p. 34 (1816). Butler, Catal. Fabr. Lep. B. M. p. 72 (1869). Moore, Lep. Ceylon, i. p. 42, pl. 22, fig. 3, 3a, ♂ ♀ (1881). Forsayeth, Trans. Ent. Soc. 1884, p. 383.

IMAGO.—Male. Upperside dark fuliginous-black; cilia brown, alternated with

white. *Forewing* with a large broad medial ochreous-yellow patch, palest in the middle, extending from near the base more or less irregularly to below the subcostal and obliquely to beyond the disc towards the posterior angle, where it is sometimes narrowed and bent downward, or includes a round black lower-discal spot between the two lower medians and thence joins the upper end below base of the cell; a subapical short white angular streak and a straight upper submarginal duller streak crossed by the veins; a small ochreous-ringed ocellus is generally present below the subapical streak. *Hindwing* with a large cobalt-blue subbasal spot; a large lower-discal broad ochreous-yellow patch extending from the submedian below the cell to the lower subcostal and thence curving downward to near the outer margin and ending above anal angle; the black outer-marginal border being sometimes more or less lunularly-included within the ochreous patch; an ochreous-grey lunule is generally present above the anal angle; abdominal border greyish-brown. Under-side. *Forewing* pale dull yellowish-ochreous; the apex, outer and posterior border being pale ochreous-brown and crossed by the upper whitish fasciæ; the upper and lower discal black ocellate spot distinct; across the cell are five more or less complete black sinuous lines and a diffused streak at its end. *Hindwing* greyish-ochreous, more or less powdered with brown scales; crossed by brown subbasal wavy lines, a discal sinuous fascia, then a row of obsolescent dots of which the lowest is more distinct and ocellate, followed by two submarginal sinuous lines.

Female. Upperside brownish-black. *Forewing* with the ochreous discal area more restricted; middle of the cell crossed by two more or less entire black streaks and a broad streak at its end; apical white fascia, and two discal black ocelli with blue central dot, disposed as in male. *Hindwing* with the lower-discal ochreous patch narrower, and bearing an upper and lower small black ocellus with blue-speckled centre; the outer marginal lunular lines entire and edged with ochreous; the subbasal blue spot smaller, more or less duller, sometimes black speckled and occasionally obsolete. Underside darker than in male; markings the same. *Body* above black, beneath and legs pale ochreous-white; palpi above brown, beneath white; antennæ black above, pale ochreous beneath.

Expanse, ♂ $1\frac{6}{10}$ to $2\frac{2}{10}$, ♀ $1\frac{6}{10}$ to $2\frac{4}{10}$ inches.

LARVA.—Cylindrical; minutely hairy; head rather small, vertex bluntly cleft, hairy; segments armed with a dorsal and lateral rows of black branched-spines; ground-colour greyish-fuliginous, dull reddish beneath; with a dorsal pale ochreous line, and lateral rows of white marks.

PUPA.—Dull reddish; head obtuse in front; thorax dorsally convex; abdomen with a dorsal and lateral rows of small blackish points. (Described from Capt. Mortimer Slater's drawing.)

HABITAT.—India; Ceylon; Burma; Tenasserim; Andaman and Nicobar Isles, etc.

DISTRIBUTION, HABITS, ETC.—“This species has a very wide range, occurring at Karachi, thence throughout India, Ceylon and the Andamans to Burma, and again in China. It delights in the sun, and to disport itself in the hottest and driest situations. In India it presents some considerable variation according to the humidity or dryness of the atmospheric conditions under which it exists, but these variations cannot be maintained as distinct species. Some male specimens from Kulu and Simla in the Western Himalayas, Sikkim, Calcutta, Orissa, the Wynaad, and Ceylon, show no costal indentation of the yellow patch on the upperside of the forewing, others from Karachi, Kulu, Simla, Calcutta, Shillong, Upper Tenasserim, and the Andamans have a distinct black tooth, which is most prominent in a specimen from Buxa, Bhotan; in all of these the black inner margin of the forewing on the upperside gives off a projection into the first median interspace, while in examples from Karachi, Simla, Buxa, Calcutta, Shillong, Sibsagar, Rangoon and Upper Burma this projection assumes the form of a more or less separate and distinct spot. The width of the marginal black band on the upperside of the forewing is also variable; and, lastly, specimens from Bhotan and Upper Assam are very large and heavily marked, owing probably to the greater rainfall of those regions” (de Nicéville, Butt. Ind. ii. 73). “This butterfly affects paths, rocky, bare hill-sides, the beds of streams where they widen out into stony expanses of sand and boulders, and similar places devoid of vegetation. They are hard to catch, flying off on one’s approach and settling on a stone or rock a few yards ahead, and on again coming near, the same performance is repeated. It was common at Kalka, Umballa District, in October, 1877, and I took it in the Botanical Gardens and nowhere else in Calcutta, in December, 1878” (de Nicéville, Indian Agriculturist, January, 1880). “Col. J. W. Yerbury took a single specimen at Kali Pani, N.W. Punjab, in September, and another at Khairabad in November, also a few between Kali Pani and Abbottabad in September” (Ann. N. H. 1888, 142). “Found in Kumaon generally, up to 7000 feet elevation” (W. Doherty, J. A. S. Bengal, 1886, 123). “Occurs somewhat rarely, at low elevations in Sikkim, west of the Tista River, but is common at 1500 feet elevation to the East” (de Nicéville, Sikk. Gaz. 1894, 136). “This butterfly and *J. Orithya* may be seen, in the Central Provinces, resting in the middle of the most exposed parts of roads and paths, and rising in front of one, it skims swiftly along and settles again on the road, perhaps after a battle in the air with one of its own kind or *J. Lemonias*, *Asterie*, or *Orithya*, all of which have the same habits and love the full hot sunshine” (J. A. Bethune, J. Bombay N. H. S. 1890, 279). “Commonly found in ditches all the year round in Bombay and the Deccan” (Col. C. Swinhoe, P. Z. S. 1885, 128). “This is not

uncommon in Bombay on the uncultivated parts of Kamballa Hill, and about dry stubble fields" (E. H. Aitken, *id.* 1886, 131). "Pretty common in open country, but absent during the monsoon. We have reared the larva in the Dekkan and Khandeish, and found many at Karwar, in October, on a plant which appeared to be a species of Barleria. The ground-colour of the larva was usually dark brown or grey, with a broad dorsal stripe formed of minute white and blue spots, spines black" (J. Davidson and E. H. Aitken, *id.* 1890, 272; 1896, 249). Mr. S. N. Ward records finding the "larva at Koonoor in January and December on the *Kolay Mooloo* and *Byle Choolee*" (MS. Notes). Col. C. H. E. Adamson records it as "very common in Burma." Signor L. Fea took it in Bhamo in July and November. Commander A. Carpenter obtained it in Mandalay in January. Dr. J. Anderson found it "very common in Mergui and King Island, Tenasserim, in December, January, and February" (J. Linn. Soc. Zool. 1886, 35).

In Ceylon, according to Mr. F. M. Mackwood, "it is a scarce, low country insect." Capt. Wade took it at Kandy and at Dambool.

We possess specimens from Kasauli, W. Himalaya; Kutch, Kattywar, Sind; Bombay; Nilgiris; Chittagong, Bhamo, Burma; Mergui; Andamans; Nicobars; Hainan; China; and Mr. J. J. Walker records it from Hong Kong.

JUNONIA LEMONIAS (Plate 313, fig. 1, 1a, b, c, d, e, ♂ ♀).

Papilio Lemonias, Linnæus, Syst. Nat. x. ed. p. 473 (1758); xii. p. 770 (1767). Clerck, Icon. Ins. iii. pl. 7, fig. 2 (*ined.*). Sulzer, Gesch. Ins. p. 144, pl. 16, fig. 7, 11 (1776). Herbst, Nat. Schmett. p. 158, pl. 177, fig. 3, 4 (1794).

Hamadryas Lemonias, Hübner, Samml. Exot. Schmett. i. pl. 50 (1806-16).

Junonia Lemonias, Doubleday and Hewits. Gen. D. Lep. p. 208. Butler, Catal. Fabr. Lep. B. M. p. 74 (1869). Moore, Lep. Ceylon, i. p. 41, pl. 21, fig. 3, 3a, ♂ ♀ (1881). Distant, Rhop. Malay. p. 96, pl. 11, fig. 5, ♂ (1882). de Nicéville, Butt. India, etc., ii. p. 70 (1886).

Papilio Aonis, Cramer, Pap. Exot. i. pl. 35, fig. D, F (1775).

Junonia Aonis, Hübner, Verz. bek. Schmett. p. 34 (1816).

IMAGO.—Male and Female. Upperside greyish olive-brown; cilia alternated with pale ochreous-yellow. *Forewing* with two black sinuous lines crossing middle of the cell, joined to a pale ochreous-yellow streak, and two black sinuous lines at its end, followed by a contiguous pale ochreous broken streak; a transverse discal outwardly-recurved row of blackish-bordered pale ochreous-yellow spots, a submarginal broken row of similar coloured but more irregular-shaped spots, and then an outer marginal row of duller coloured lunular spots; a subapical very indistinct small black ocellus with blue central dot and reddish outer ring between the radial veinlets, and a large prominent red-ringed similar ocellus between the lower and middle medians. *Hindwing* with a large prominent similar ocellus with bright red

ring and outer black ring placed between and extending over the lower subcostal and radial, this ocellus being either simply round and perfect, or the outer red and black ring encompassing a smaller upper blue-centred black spot, and sometimes also a still smaller lower spot; a small obscure brown ocellated spot is also generally present between the lower median veinlets; two short indistinct black lines at end of the cell, and two outer marginal black lunular lines outwardly-bordered by pale ochreous lines. Underside. Both wings (in the *wet-season* form) brownish-ochreous; crossed by pale yellowish-ochreous basal, discal, and marginal sinuous fasciæ, the forewing having the two ocelli as on upperside, but less defined, and the hindwing the two ocelli either very small, and of equal size, or both the latter are large and the upper one duplex. In the *dry-season* form both wings are uniformly pale dull yellowish-ochreous or ochreous-red; with paler-defined transverse markings, the lower ocellus only being present on the forewing, and a series of minute ocellate spots on the hindwing. *Body* and palpi above olive-brown, beneath and legs pale ochreous-white; antennæ dark brown above, ochreous edged with white beneath.

Expanse, ♂ $1\frac{8}{10}$ to $2\frac{2}{10}$, ♀ $2\frac{2}{10}$ to $2\frac{4}{10}$ inches.

LARVA.—“*After first moult*; ground-colour jet black, with four equidistant rows of conical jet-black spines which are finely branched; abdomen pale brown-black; legs black; head black, with a transverse yellow band behind; stigmata white. *After last moult*. Length one inch, cylindrical and spiny; lead-colour, minutely spotted with darker and whitish dots; dorsal line black as far as 1st and 2nd segments, and then replaced all the way by a row of black branched-spines; also four rows of equidistant black longitudinally-placed spines; lateral line milky; abdomen and legs lead-colour, thoracic legs black; head brown, strongly speckled with elevated black spots and having two little bundles of spiny hairs in front, and on centre a white triangular patch, shaded all round with black; anterior portion of first segment yellow-ochre; sides of segments transversely striated with dark lead-colour; stigmata black. *Habits*. Lazy. *Food-plant*.—The thorny *Barleria* (*Barleria prionitis*). *Changed to Pupa* on the 28th Sept., 1860.”

PUPA.—“Suspended; light brown, speckled with whitish and variegated with darker brown. *Imago* emerged on 5th Oct., 1860” (Capt. H. L. Chaumette, Lucknow, 1861. *MS. Notes*).

HABITAT.—“India; Ceylon; Burma; Tenasserim; Malay Peninsula; Siam; S. China; Hong Kong; Hainan; Formosa; Philippines.

DISTRIBUTION, HABITS, ETC.—This is a widely-spread and common Indian species, occurring almost everywhere in the plains in the region of heavy rainfall, and extending into the Hills up to 7000 feet elevation. I possess two ‘sports,’ both females, from Malda and Orissa, which have all the markings blurred and obliterated on both sides” (de Nicéville, *Butt. Ind.* ii. 70). Mr. W. Doherty took it in

“Kumaon; plains up to 6000 feet elevation” (J. A. S. Bengal, 1886, 123). “Common all the year at Lucknow. Flight rapid, generally with out-spread wings, soaring along the ground so that it is difficult to trace them. Fond of fruits, particularly that of the Guava. Larva reared in Sept., on *Barleria prionitis*” (Capt. H. L. Chaumette, MS. Notes). “Common in Sikkim up to 5000 feet, and found all the year round” (H. J. Elwes, Tr. Ent. Soc. 1888, 342). “This is the commonest species of the genus in the Central Provinces, and is found everywhere. It is fond of hedges and ditches, and is a very sprightly and pugnacious butterfly” (J. A. Bethune, J. Bombay N. H. S. 1890, 279). “Commonly found in ditches all the year round, in Bombay and the Deccan” (Col. C. Swinhoe, P. Z. S. 1885, 128). “Though not rare anywhere, this is the commonest butterfly in Bombay at the close of the rains and for some time after. It attains in old age to a degree of disreputability and raggedness not often seen in any other species. I am inclined to think this is the result of ineffectual attempts to catch it on the part of lizards, with which it is a favourite food. The larva feeds on *Lippia nodiflora* and *Asteracantha longifolia*, both very abundant in Bombay during the monsoon, by the side of, or actually in water. The larva is scarcely distinguishable from that of *J. Almana*. I have also found the larva on *Barleria prionitis*” (E. H. Aitken, J. Bombay N. H. S. 1886, 131). “It frequents drier country than *Asterie* and *Almana*; it is also found in thick forest, where the larva feeds on *Strobilanthus*. The larva has two minute spines on the head, which are wanting or less developed in the others (*id.* 1896, 249). “Common in the Travancore Hills up to 2500 feet elevation” (H. S. Ferguson, J. Bombay N. H. S. 1891, 8). In Ceylon it “occurs in the Eastern and Western Provinces, in low country forests and cultivated ground. Found occasionally, at uncertain intervals, at Colombo, more common on the road to Trincomalie. Flight quick; settles on the ground” (Lep. Ceylon, i. 41). “Very common throughout Burma. I have one ‘sport’ caught in September on the Upper Chindwin, with all the markings, including the ocelli on the upperside of the wings, obsolete, with the exception of an indistinct submarginal paler line” (Col. C. H. E. Adamson, List, 1897, 19). Signor L. Fea took it at Cheba in November, and at Palone in August. Commander A. Carpenter, R.N., obtained it at “Sheemagar, Upper Burma, in December, and at Katha in January” (Ann. N. H. 1886, 184). Mr. Otto Limborg took it at “Ahsown, 2000 feet, Moulmein, Meetan, at 3000 feet, and at Taso, in March” (P. Z. S. 1878, 828). Dr. J. Anderson found it “very common in the Mergui Archipelago, in December, January, and March” (J. Linn. Soc. Zool. 1886, 35). Mr. H. Druce records it from Chentaboon and Nahconchaisee, Siam” (P. Z. S. 1874, 105).

Of our illustrations on Plate 313, fig. 1, 1a, d, e, represent the upper and underside of *wet-season* form, and fig. 1b, c the underside of *dry-season* form.

JUNONIA ALMANA.

Dry-season form (Plate 314, fig. 1, larva and pupa, 1a, b, c, ♂ ♀).

Papilio Alman, Linnæus, Syst. Nat. x. ed. p. 472 (1758); xii. p. 769 (1767). Fabricius, Syst. Ent. p. 490 (1775). Cramer, Pap. Exot. i. pl. 58, fig. F, G (1775). Herbst, Pap. pl. 172, fig. 1, 2 (1794). Donovan, Ins. China, pl. 36, fig. 2 (1798).

Alcyoneis Alman, Hübner, Verz. bek. Schmett. p. 35 (1816).

Junonia Alman, Doubleday and Hewits. Gen. D. Lep. p. 209 (1849). Moore, Catal. Lep. Mus. E. I. C. i. pl. 12, fig. 12, 12a, larva and pupa (1857). Butler, Catal. Fabr. Lep. B. M. p. 72 (1869). Swinhoe, P. Z. S. 1885, p. 128. de Nicéville, Butt. India, etc., ii. p. 61 (1886).

IMAGO.—Male and female. *Forewing* with the extreme edge of exterior margin even and acutely angulated outward below the apex and obtusely at end of lower median. *Hindwing* also even and obtusely angulated at end of upper median and prolonged at anal angle. Upperside ochreous-red, basal areas slightly infuscated. *Forewing* with the costal border and outer margin ochreous-brown; two black sinuous lines crossing middle of the cell, two at its end with the internal area dark bluish-black, followed by a somewhat similar black narrower fascia, between which and the apex is a subtriangular black patch more or less enclosing two ocellated spots, the upper spot smallest or generally obsolete, the lower spot blue-black with whitish-speckled centre; a lower-discal larger similar ocellated spot, with black outer ring, between the middle and lower medians; a submarginal and two marginal blackish sinuous lines. *Hindwing* with a very large upper-discal ocellated spot, which is purplish with two small inner dentate dots and outer black patch, yellow ring and outer black ring; a much smaller similar lower-discal ocellated spot with small white dot, which is more or less ill-defined and sometimes obsolete; submarginal and marginal sinuous lines as on forewing, but more defined. Underside pale or obscure brownish-ochreous. *Forewing* crossed by three obscure basal darker sinuous fasciæ, a discal slender sinuous pale line, an outer-discal dusky fascia traversed by a row of small blackish dots and a lower ill-defined ocellus, followed by a submarginal sinuous line. *Hindwing* crossed by a subbasal wavy pale ochreous line and a straight dark-edged discal line, an outer-discal row of small blackish dots, of which the upper two and sometimes the lowest are obscurely ocellate, followed by a submarginal sinuous brown line. *Body* above ochreous-red; palpi above brownish-ochreous; body and palpi beneath and legs pale whitish-ochreous; antennæ dark brown above, beneath and tip ochreous.

Expanse, ♂ $1\frac{8}{10}$ to $2\frac{2}{10}$, ♀ $2\frac{2}{10}$ to $2\frac{5}{10}$ inches.

Wet-season form (Plate 314, fig. 1, d, e, f, ♂ ♀).

Papilio Asterie, Linnæus, Syst. Nat. x. ed. p. 472 (1758); xii. p. 769 (1767). Fabricius, Syst. Ent. p. 490 (1775). Cramer, Pap. Exot. i. pl. 58, fig. D, E (1775). Herbst, Pap. p. 131, pl. 172, fig. 3, 4 (1794).

Alcyoneis Asterie, Hübner, Verz. bek. Schmett. p. 35 (1816).

Vanessa Asterie, Horsfield, Catal. Lep. Mus. E. I. C. pl. 7, fig 1, 1a, *larva* and *pupa* (1829).

Junonia Asterie, Doubleday and Hewits. Gen. D. Lep. p. 209 (1849). Moore, Catal. Lep. Mus.

E. I. C. i. p. 142, pl. 5, fig. 6, 6a, *larva* and *pupa* (1857); Lep. Ceylon, i. p. 43, pl. 22, fig. 2 (1881). Butler, Catal. Fabr. Lep. B. M. p. 72 (1869). Distant, Rhop. Malay. p. 94, pl. 11, fig. 1, 2 (1882). de Nicéville, Butt. India, etc., ii. p. 67 (1886).

Papilio Almanæ, Clerck, Icon. Ins. iii. pl. 5, fig. 3 (*ined.*); Linn. Mus. Ulr. p. 272 (1764).

Junonia Nicobariensis et Javana, Felder, Verh. Z. B. Gesch. 1862, pp. 482, 487.

IMAGO.—Male and female. *Forewing* with the outer margin slightly angular below the apex, and slightly scalloped. *Hindwing* with the exterior margin convex and slightly scalloped, anal angle pointed. Upperside ochreous-red, basal area slightly infuscated. Both wings with all the markings as in *dry-season* form, except that the marginal lines are darker and more prominent. Underside pale brownish-ochreous. *Forewing* crossed by blackish basal, discal, and marginal sinuous lines, those of the two former with pale inter-area, the two upper and the lower ocellus well defined. *Hindwing* crossed by a subbasal wavy blackish line inwardly bordered by ochreous-white, and a similar whiter-bordered straight discal line, the ocelli prominent, the upper oval and duplex, the lower larger than on upperside; marginal lines distinct. *Body* above ochreous-red, palpi brown, beneath and legs pale whitish-ochreous.

Expanse, ♂ $1\frac{8}{10}$ to $2\frac{2}{10}$, ♀ $2\frac{2}{10}$ to $2\frac{4}{10}$ inches.

LARVA.—Cylindrical. Head blackish, slightly hairy. Body pale ochreous-brown, with a dorsal, subdorsal and lateral blackish line, and a row of small black-ringed spots below the latter; second segment anteriorly with a transverse reddish stripe; second, third, and fourth segment posteriorly with a transverse blackish stripe; second to last segment armed with a dorsal, subdorsal, and two lateral rows of short fine branched-spines.

PUPA.—Rather short and thick; head and thorax broad, head-piece pointed beneath; thorax and abdomen dorsally with short tubercular points; colour brownish-ochreous. (Described from Mr. A. Grote's Calcutta Drawing.)

HABITAT.—India; Ceylon; Burma; Tenasserim; Andaman and Nicobar Isles; Malay Peninsula; Sumatra; Java; Borneo; S. China; Hong Kong; Formosa; Philippines; Japan.

DISTRIBUTION, SEASONAL APPEARANCE, HABITS, ETC.—“This species (*Almanæ*) occurs throughout continental and peninsular India and in the outer Himalayas up to about 6000 feet elevation. It is not recorded from Ceylon or the Malay Peninsula, but is common through Assam, Silhet, Cachar to Burma, Mergui and Upper Tenasserim. It occurs in the Andamans, in Java and China, and wherever met with is a common insect. It will be seen from the localities quoted above, that

except in Ceylon, the Nicobars and the Malay Peninsula, *J. almana* is found wherever *J. asterie* occurs; and from observations I have made on the time of appearance of the two forms, I have found that *J. almana* is the prevailing form in the *dry-season*, while *J. asterie* abounds in the *wet-season*, the times of appearance and periods of existence occasionally overlap somewhat; a worn *J. almana* may be found early in the rains, or a *J. asterie* now and then in the early winter, but speaking generally, the summer brood is *J. asterie*, and the winter brood is *J. almana*, and it is very probable that further investigation will reveal that they are merely seasonal forms of one and the same species. The two forms are variable also both in outline of the wings and in the markings of the underside: in some specimens of *J. asterie* the forewing is almost as truncate, and the hindwing as prominently tailed, as in *J. almana*, while the ocelli on the underside are very inconstant; they vary much in size, and in some specimens they are so pale and obscure as to be barely traceable, and it is difficult, if not impossible, to decide to which form these intermediate specimens belong. The absence of *J. almana* from the localities noted above, if it be a fact, might be accounted for by the seasons in those parts being more equable and more uniformly moist throughout the year; but the question of the distinctness or otherwise of the two forms can only be satisfactorily settled by a series of experiments in breeding them. *J. asterie* is a common butterfly throughout the tract of heavy rainfall, and is abundant where it occurs; it frequents gardens and glades in jungles, but shuns the bare open plains" (de Nicéville, Butt. Ind. ii. p. 68). Col. J. W. Yerbury records the capture of *Almana* at Attock, north-west of Campbellpur, in March, and at Hurripur in October. *Asterie* was taken at Khairabad, opposite Attock across the Indus, in April, May, and July, and at Campbellpur in May, and at Hassan Abdal in May" (Ann. N. H. 1888, p. 141.) Both *Almana* and *Asterie* are found in the Sarju and Kali Valleys, 2000 to 4000 feet elevation, in Kumaon, and in the Tarai. The prehensores are the same in both. I have no doubt that the former is the *dry-season* form and the latter the *wet* form. Colonel C. Swinhoe remarks that "*J. almana* is common everywhere, in Bombay and the Deccan, all the year round, *J. asterie* is common in the latter half of the year. I am convinced that, although the types of each are so different, they are both one and the same insect, one being the normal and the other the dimorphic form, and I have a long series of examples showing every stage of variety between the two" (P. Z. S. 1885, 128). We possess a male, taken at Poona in March by Col. Swinhoe, which has the outline of both wings less angulated than in the normal dry-season form (*Almana*) and the colours and markings on the underside distinctly gradating to the *wet-season* form. "*J. asterie* and *J. almana*, I am persuaded, are one and the same species. In the Central Provinces they are found in glades and gardens by the margins of streams and about tanks, and sits and fans its wings in the sunshine.

J. Asterie is the commoner in the wet-season, while *J. almana* predominates in the dry-season" (J. A. Bethune, J. Bombay N. H. S. 1890, 279). "Common everywhere in the Bombay district, frequenting damp grounds and ditches. The *Almana* form appears in October, and gives place to *Asterie* in June" (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 249). "We have reared *Almana* in Bombay on *Asteracantha longifolia*, which grows in wet ditches everywhere during the monsoon and withers soon after. The butterfly appears in October, a little later than *Asterie*. In Bombay we have reared *Asterie* on *Lippia nodiflora*, and once, in company with *Almana*, on *A. longifolia*" (id. l.c. 1890, 272). Mr. F. M. Mackwood states that *Asterie* is "found in Ceylon all the year round, occurring in the Plains and up to 4000 feet. Very abundant about September to November. Capt. Hutchison found it, in the Plains of the Western Provinces, in open and waste land among shrubs. Its habits like those of *Orithya*, but quicker in flight and more shy. Capt. Wade took it at Galle and Kandy; sits on roads and paths basking in the sun (Lep. Ceylon i. 43). Mr. A. Grote, in his Calcutta drawings, states that the larva "feeds on *Gloxinia* and *Osbeckia*." "In Sikkim it is found at low elevations throughout the year. It is, however, rarer west of the Tista river than it is on the eastern side, and it does not appear to occur in the inner valleys. I do not think there can be any doubt about *Almana* being the dry-season and *Asterie* the wet-season form of one and the same species" (de Nicéville, Sikkim Gaz. 1894, 135). "Both forms of this insect are very common throughout Burma, the ocellated form (*Asterie*) appears to be the more abundant, as I have caught it in all the months of the year, while the unocellated form I have only caught in Lower Burma from November till June" (Col. C. H. E. Adamson, List 1897, 18). Dr. J. Anderson records both forms (*Asterie* and *Almana*) as being taken in "Minthantoung, Mergui, in December" (J. Linn. Soc. Zool. 1886, 34). Mr. H. Druce records it from "Nahconchaisee, Siam" (P. Z. S. 1874, 105). Mr. J. J. Walker (Tr. Ent. Soc. 1895, 453) records it as "common in Hong Kong among long grass, especially in somewhat damp open places, but also found on the flowers of *Lantana camera*. Those taken in December, January, and February are nearly all of the form *Almana*, occasionally, however, examples occur in these months with the ocelli of the under-side more or less developed, approaching in this respect to the wet-season form *Asterie*, which appears at the end of April and in May. I also found *Almana* commonly at Hang-chau, Haining, and Shanghai, in October, the specimens being much larger and finer than those taken in Hong Kong." We possess specimens from Java showing that both the *dry* and *wet-season* forms do occur there. The *dry-season* form, however, has the outline of the wings as in *Asterie* (wet-season), the under-side being dull brownish-ochreous, with markings and the discal row of small black dots, as in *Almana*. The Javan wet-season form being normal *Asterie*.

INDO-MALAYAN SPECIES.—*Junonia neglecta* (Precis neglecta, Swinhoe, Ann. Nat. Hist. 1899, p. 103). *Habitat.* N. Borneo; Sarawak.—*Junonia Horsfieldii*. Male and female. Distinguishable from Indian, Burmese, and Malacca examples of *J. Iphita*, on the upperside, by the uniformly darker basal area, discal and outer band; the discal edge of the basal area on forewing being less angulated above the median, the discal fascia on both wings broader and more diffused, the submarginal line being also broadly diffused, the ocellate spots on the hindwing are small and well defined. Expanse, ♂ $2\frac{2}{10}$, ♀ $2\frac{5}{10}$ inches. *Habitat.* Java.—*Junonia intermedia* (Precis intermedia, Felder, Reise Nov. Lep. iii. p. 402 (1866). *Habitat.* Macassar; Celebes.—*Junonia Erigone* (Pap. Erigone, Cram. Pap. Exot. i. pl. 62, fig. E. F. (1779). *Habitat.* Java.—*Junonia Ida* (Pap. Ida, Cramer, Pap. Exot. i. pl. 42, fig. C. D. (1775), *id.* iv. pl. 374, fig. C. D.). Precis Ida, Distant, Rhop. Malay. p. 92, pl. xi. fig. 10 (1882). *Habitat.* Malay Peninsula; Nias; Sumatra; Billiton, Sarawak, Borneo; Java.—*Junonia Adelaida* (Precis Adelaida, Staudinger, Deuts. Ent. Zeit. 1889, p. 51). *Habitat.* Palawan.—*Junonia Wallacei*, Distant, Rhop. Malay. p. 95, pl. xi. fig. 3, 4, ♂ ♀ (1883). Pap. Ocyale, Hübner, Samml. Exot. Schmett. ii. pl. 33, fig. 1–4 (1820–6). *Habitat.* Malay Peninsula; Borneo; Sumatra; Java.—*Junonia Villida* (Pap. Villida, Fabricius, Mant. Ins. ii. p. 35 (1787). Donovan, Ins. N. Holl. pl. 25, fig. 3). Moore, Catal. Lep. Mus. E. I. C. i. p. 141 (1857). *Habitat.* Australia (Port Darwin, Champion Bay). Gilbert Island; Viti; Ellice Island; New Guinea; Java (Horsfield); Sumatra (Raffles). We possess a male and female of *Villida* from Horsfield's collection, both in very fine condition, labelled "Java, November," and a male, also labelled "Java," from another collection.

Genus EUVANESSA.

Euvanessa, Scudder, Butt. E. U. S. i. p. 387 (1889).

Papilio, Scudder, Syst. Rev. Amer. Butt. pp. 11, 16 (1872).

Scudderia, Grote, Canadian Ent. v. p. 144 (1873), *pre-occupied*.

Vanessa (part), Auctorum.

IMAGO.—Wings broad. Male. *Forewing* subtriangular; costa slightly arched from the base; exterior margin very slightly oblique, acutely scalloped, a prominent angle projecting below the apex and a lesser angle at end of lower median veinlet; posterior margin nearly straight; costal vein extending to about two-thirds the margin; first subcostal branch emitted at one-third before end of cell, second branch at one-ninth before the end; upper and middle discocellulars very short, middle concave at its base, lower discocellular very slender and obliquely recurved; cell broad; middle median veinlet emitted opposite upper discocellular at from considerable distance before lower end of the cell. *Hindwing* triangulate; arched from the base; exterior margin obliquely convex, acutely scalloped, and with a prominent

projecting caudate point at end of upper median; precostal vein bent inward; cell closed by a slender lower discocellular veinlet. Both wings beneath with very numerous long fine rigid bristly hairs projecting from between the scales, some of the hairs on the forewing being projected forward from front of the base of the costa. *Body* very robust, thorax densely woolly above and thickly clothed beneath with long fine rigid hairs; palpi porrect, slender, projecting half beyond the front, laxly clothed with fine long rigid hairs; fore tibiæ and tarsi of the male sparsely clothed with long fine bristly hairs, femora with shorter and more delicate hairs beneath; fore tibiæ and tarsi of the female more sparsely clothed with long fine bristly hairs, tarsal joints apical and minutely spurred at sides beneath; antennæ with a lengthened cylindrical club; eyes hairy.

LARVA.—Head subquadrate in front, sides rounded, almost flat, vertex indented in the middle, numerous covered with short conical tubercles, the smallest emitting each a short hair. Body cylindrical, very minutely warted and hairy; armed with a dorsal and five lateral rows of long minutely-branched spines.

PUPA.—Stout. Thorax dorsally angled and with a larger hindward projected pointed process; abdominal segments with a dorsal and a lateral row of broad tubercular points; wing cases somewhat large; head-piece widely cleft and pointed.

TYPE.—E. Antiopa.

EUVANESSA ANTIOPA (Plate 316, fig. 1, 1a, ♂).

- Papilio Antiopa*, Linnæus, Syst. Nat. x. ed. p. 476 (1758); *id.* xii. ed. p. 776 (1767). Esper, Schmett. i. pt. i. pl. 12, fig. 2 (1777); *id.* pl. 29, f. 2 (1778). Hübner, Eur. Schmett. i. fig. 79, 80 (1793). Scudder, Syst. Rev. Amer. Butt. pp. 11—16 (1872).
Vanessa Antiopa, Godart, Enc. Méth. ix. p. 308 (1819). Moore, Catal. Lep. Mus. E. I. C. i. p. 136 (1857). Elwes, Proc. Zool. Soc. 1881, p. 898. de Nicéville, Butt. of India, etc., ii. p. 232 (1886). Leech, Butt. of China, etc., i. p. 256 (1893). Kirby, Allen's Nat. Hist. Butt. i. p. 88 (1894).
Eugonia Antiopa, Hübner, Verz. bek. Schmett. p. 37 (1816).
Scudderia Antiopa, Grote, Canadian Ent. v. p. 144 (1873).
Nymphalis Antiopa, Kirby, Catal. D. Lep. Suppl. p. 732 (1877).
Euvanessa Antiopa, Scudder, Butt. E. U. S. i. p. 397 (1889).

IMAGO.—Male and female. Upperside. Both wings rich dark purpurescent-

Genus NYMPHALIS,* Linnæus, S. N. x. ed. p. 472 (1758). *id.* xii. ed. i. 2, p. 769 (1767). Esper, Schmett. p. 87 (1777). Barbut, Gen. Ins. Linné, pp. 162, 172 (1781). Cuvier, Tabl. Elem. H. N. p. 589 (1798). Kirby, Syn. Catal. D. Lep. App. p. 648 (1871); *id.* Suppl. p. 732 (1877). Moore, Lep. Indica, ii. p. 226 (1895). Syn. Hamadryas, Hübner, Tent. i. (1806). Inachis, Hübn. Verz. p. 37 (1816). Vanessa, Moore, Lep. Ceylon, i. p. 48 (1880).—TYPE *Nymphalis Io*, Linn.

* We refer the origin and authorship of this genus to Linnæus. See Historical Note (Lep. Indica, ii. p. 226) on its restriction to the typical species, as here assigned.

red, the outer border with a broad ochreous marginal band, which is more or less densely marked with black-speckled transverse strigæ, and is inwardly bordered by a parallel black sinuous-edged band, which latter is broadest on the hindwing, and on both wings bearing a series of rich shining blue spots between the veins, these spots being dentate on forewing, and more of an oval shape on hindwing, becoming obsolescent towards the anal angle. *Forewing* also with the costal border black, striated with ochreous, and having two paler ochreous short broad bars before the apex. *Underside*. Both wings rich dark purpurescent greyish-black, densely covered with transverse black strigæ; marginal ochreous band as above, but paler and more densely striated, its inner bordering band formed of narrow black dentate marks with bluish-grey speckled centres; a very small ochreous dentate spot at lower end of each cell. *Forewing* also with less defined pale ochreous costal strigæ, and the two narrower bars before the apex. *Hindwing* also crossed by a slender black irregular discal line. *Body* above dark purpurescent-red; palpi blackish, the sides ochreous; forelegs, middle and hind femora blackish, middle and hind tibiae and tarsi ochreous; antennæ black, tip and beneath reddish-ochreous.

Expanse, ♂ 3, ♀ $3\frac{2}{10}$ inches.

HABITAT.—Europe; C. Asia; E. Himalayas; W. China; Amurland; Japan.

DISTRIBUTION.—“Within our limits, this species has been obtained by Mr. H. J. Elwes and Mr. Otto Moller, in native Sikkim and across the passes in Chumbi. It has also been recorded from Bhotan” (de Nicéville, *l.c.* 233). “I have no knowledge of the occurrence of this in Sikkim proper, although I received a considerable number from native collectors, which were taken in Chumbi or Bhotan, in July and August. I am not aware that it has been taken in any other part of the Himalayas” (Elwes, *Tr. Ent. Soc.* 1888, 362).

Genus EUGONIA.

Eugonia, Hübner, Verz. bek. Schmett. p. 36 (1816). Stephens, Catal. Brit. Lep. B. M. p. 12 (1850)

Scudder, Butt. E. U. S. i. p. 372 (1889).

Nymphalis, Scudder, Syst. Rev. Amer. Butt. p. 10 (1872).

Vanessa, Staudinger et Schätz, Exot. Schmett. ii. p. 124 (1887). Kirby, Allen's Nat. Hist. Butt. i. p. 88 (1894).

IMAGO.—Wings broad. Male. *Forewing* subtriangular; costa much arched from the base; exterior margin slightly oblique, prominently scalloped and broadly angled below the apex and at end of lower median veinlet; posterior margin nearly straight; costal vein extending to half the margin; first subcostal branch emitted at about one-fourth before end of the cell, second close to the end; upper and middle discocellular of nearly equal length, middle bent outward near its base, lower

discocellular slender and obliquely recurved; middle median veinlet from some considerable distance before lower end of cell, lower median at fully half before the end. *Hindwing* short, triangular; exterior margin very obliquely convex, prominently scalloped, with a prominent projecting broadly-obtuse caudate angle at end of upper median, and a less similar angle at end of lower median; precostal vein straight; cell closed by a slender lower discocellular veinlet. Wings beneath with numerous projecting rigid bristly hairs, some of which project forward from base of costa on the forewing. *Body* robust; palpi somewhat compressed laterally, clothed throughout with short erect hair-like scales, interspersed with long erect bristly hairs; antennæ with a stout cylindrical club; fore tibiæ and tarsi, in the *male*, rather thickly but laxly clothed with longish fine silky hairs interspersed with much longer and more bristly hairs; femora beneath with longish fine silky hairs; fore tibiæ and tarsi, in the *female*, less thickly clothed with fine longish hairs, shortest and decreasing to near tip of tarsi, apical joints minutely spined. Eyes hairy.

LARVA.—Cylindrical, slightly hairy. Head subquadrate, vertex sharply indented in front, slightly hairy, front and cheeks with several small pointed tubercles. Third to last segment armed with a dorsal row of short spines and three lateral rows of long rigid branched-spines.

PUPA.—Stout. Head-piece cleft and pointed; thorax with a rounded posterior prominence; abdominal segments with a dorsal row of points and a lateral row of lesser tubercular points.

TYPE.—E. Polychloros.

EUGONIA XANTHOMELAS (Plate 316, fig. 2, 2a, ♂ ♀).

Papilio Xanthomelas, Denis et Schieffermüller, Wien. Verz. p. 176 (1776). Esper, Schmett. i. pt. 2, pl. 63, fig. 4 (1780). Hübner, Eur. Schmett. i. fig. 85, 86 (1793). Ochsenheimer, Schmett. Eur. i. p. 117 (1807).

Vanessa Xanthomelas, Godart, Enc. Méth. ix. p. 820 (1823). Moore, Catal. Lep. Mus. E. I. C. i. p. 137 (1857); P. Z. S. 1882, p. 240. de Nicéville, Butt. of India, etc., ii. p. 235, pl. 18, fig. 73, ♂ (1886). Leech, Butt. China, etc., i. p. 260 (1893).

IMAGO.—Male and female. Upperside rich fulvous. *Forewing* with the costal edge more or less striated with olivescence-ochreous and black; two black spots superposed obliquely outward in middle of the cell, which are often more or less joined together and sometimes forming a single quadrate spot; a large quadrate black patch from the costa at end of the cell, then a pale yellow diffused costal patch, another black patch outwardly decreasing in width to or below the lower radial, and then a pale yellow more or less narrow subcostal macular streak; within the disc are two superposed somewhat quadrate black spots between the upper and

lower medians, and two black spots within the submedian interspace; the inner spot largest, the outer one more or less distinct, or formed by sparsely disposed black speckles or sometimes obsolescent; outer margin broadly black and traversed by two ill-defined ochreous marginal lunular lines edged inwardly by a blue-speckled line and outwardly at ends of the veins by blue-speckled spots. *Hindwing* with a large irregular-shaped black patch from the middle of costa decreasing in width to the radial veinlet, the discocellulars defined by two black-speckled lines; outer margin broadly black, and traversed by a prominent continuous series of blue lunules, and two outer ochreous lines, the angled ends of the veins also blue-speckled; abdominal margin greyish-brown. Underside ochreous, densely covered with darker brown and black slender strigæ; the basal half and outer margins almost black; sinuous cell marks and outer marginal lunules with dull dark bluish-grey centres; base of wings clothed with numerous long fine hairs, some of which on the forewing project from front of the costa. *Body* and palpi above olivaceous-brown, beneath and legs pale ochreous-brown; antennæ black above and annulated with white, beneath and tip reddish ochreous.

Expanse, ♂ $2\frac{2}{10}$ to $2\frac{4}{10}$, ♀ $2\frac{6}{10}$ to 3 inches.

LARVA.—Cylindrical, slightly hairy. Head subquadrate, vertex sharply indented in front, slightly hairy, front and cheeks with several small pointed tubercles. Third to last segment armed with a dorsal row of short spines and three lateral rows of long rigid branched-spines. Colour dark purpurescent-brown, almost black, palest beneath; with two dorsal slender yellowish macular lines and a single similar lateral line, the subdorsal and sublateral area longitudinally speckled with numerous irregular-shaped yellow dots. Spines black; head black. Reared on willow. (Described from preserved specimen, Coll. Hocking.)

HABITAT.—E. Europe; W. Himalayas; C. Asia; Corea; Japan.

DISTRIBUTION.—“In India this is a rare species, and appears to be confined to the Western Himalayas. In Simla and Kulu it appears on the wing in the early summer for a very short period just after it has emerged from the pupa, it then disappears till the following spring, when the eggs are laid and the early stages of the insect rapidly passed through. Dr. T. C. Jerdon took a single specimen at Goolmurg in Kashmir. I have taken it near Dalhousie. Mr. A. Graham Young has bred it in Kulu on the ‘Kukkuree’ *Pistachia integerrima*, the ‘larva being gregarious, under a loose web whilst feeding, when about to change to pupæ they desert the food-plant and disperse amongst low herbage’” (de Nicéville, Butt. Ind. ii. 235). “It is by no means a common insect, I have taken a few at Simla, again at Kujeah, near Dalhousie, in May, and at Ulwas, near Pangri, a little later on” (*id.* Indian Agriculturist, January, 1880). “It occurs at Goolmurg, Cashmere, in July and August. It is taken in the Simla district, where, however, it is not common”

(Capt. A. M. Lang, MS. Notes). It is "very rare in Masuri, a few hybernated specimens make their appearance in February. In March and April a fresh brood appears, which frequents the Rhododendron flowers. It occurs also at Nag Tiba, 8000 feet elevation, in May. The larva feeds on *Celtis australis*, N. O. Urticacæ, and on a wild willow" (P. W. Mackinnon, J. Bombay N. H. Soc. 1898, 375). The Rev. J. H. Hocking "found the larva on willow on March 30th, in the Kangra district. Fed up April 6th; in pupa state from April 16th to 24th. Imago emerged on May 9th" (P. Z. S. 1882, 240).

Genus AGLAIS.

Aglais, Dalmann, Vetensk. Acad. Handl. xxxvii. pp. 56, 64 (1816). Scudder, Syst. Rev. Amer. Butt. p. 16 (1872); Butt. E. U. S. i. p. 413 (1889).

Vanessa (part), Auctorum.

IMAGO.—Wings broad. Male. *Forewing* triangular; costa much arched from the base, exterior margin slightly oblique, scalloped, and obtusely angled below the apex; posterior margin straight; costal vein extending to half the margin; first subcostal branch emitted at one-fifth before end of the cell, second branch close before the end; upper discocellular short, middle three times the length of upper, concave, lower discocellular slender, straight. *Hindwing* short, triangular; exterior margin obliquely convex, scalloped, with a projecting angle at end of upper median veinlet; precostal vein straight; discocellulars outwardly oblique; cell broad, closed. *Body* stout, palpi densely clothed with fine long and shorter hairs throughout; fore tibiæ and tarsi, in the *male*, rather thickly clothed with uniformly fine longish silky hairs; femora beneath the same; fore tibiæ and tarsi, in the *female*, laxly clothed with uniformly fine longish silky hairs, tarsal joints quite apical, the spines slender; antennæ with a short stout cylindrical club; eyes hairy.

LARVA.—Head rather flat in front, slightly indented at vertex, studded with bristly-points and hairs. Third to last segment armed with a dorsal and three lateral rows of branched-spines.

PUPA.—Head-piece pointed and bifid; thorax raised to a central angular ridge; abdominal segments with a dorsal and a lateral row of blunt tubercles.

TYPE.—A. Urticæ.

AGLAIS KASCHMIRENSIS (Plate 316, fig. 3, 3a, ♂ ♀).

Vanessa Caschmirensis, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 442, pl. xi. fig. 3, 4 (1844). Moore, Catal. Lep. Mus. E. I. C. i. p. 137 (1857). de Nicéville, Butt. of India, etc., ii. p. 233 (1886).

Vanessa Kaschmirensis, Moore, Proc. Zool. Soc. 1882, p. 240. Doherty, Journ. As. Soc. Bengal, 1886, p. 121.

Vanessa Kashmeriensis, Elwes, P. Z. S. 1882, p. 403.

Vanessa Flacilla, Doubleday MS., in Gray's Lep. Ins. Nepal, p. 11 (1846).

IMAGO.—Male and female. *Forewing* with the ground-colour of the cell and discal area rich chestnut-red; base of the costa with short black and olivescence-ochreous strigæ; base of the cell and posterior margin densely covered with olivescence-ochreous scales; a black quadrate bar across middle of the cell, then a pale yellow bar, then another much broader black bar from the costal to upper median, with another pale yellow bar beyond it, and then again a third broad black bar with a small bluish-white costal spot placed outwardly beyond it; within the discal area are two rounded black superposed spots between the median interspaces, the lower one being the largest, and below which is an ill-defined narrow streak formed by blackish scales; a larger but more irregular and diffused black spot placed inwardly between the lower median and submedian, and having a narrow diffused pale yellow or whitish patch between it and the outer streak; outer margin broadly greyish-fuliginous traversed by a medial blacker lunular fascia and two outer paler lines. *Hindwing* with the basal two-thirds black, densely irrorated basally with olivescence-ochreous scales and numerous covered with similar coloured or reddish hairs; a broad outer-discal chestnut-red band with its inner edge irregular and its outer edge even, and its costal end diffusedly-speckled with pale yellow or whitish scales; outer margin broadly greyish-fuliginous, traversed by a medial row of prominent deep black dentate-lunules with blue-speckled centres, and two outer marginal paler lines; abdominal margin greyish-fuliginous. Underside ochreous-brown, densely covered with slender short black strigæ; basal two-thirds clouded with dark brown and outwardly defined by an irregular zigzag black line, which is most distinct on the hindwing; cells of both wings crossed by two pairs of sinuous black lines centred with dull dark bluish-grey; outer margins traversed by a continuous row of black-speckled lunules with dull bluish-grey centres. *Body* and palpi above dark olivescence-brown, beneath and legs olivescence-grey; antennæ black above and articulated with white, shaft beneath and tip ochreous-red.

Expanse, ♂ 2 to $2\frac{2}{10}$, ♀ $2\frac{4}{10}$ to $2\frac{6}{10}$ inches.

LARVA.—Head subquadrate, slightly hairy, vertex indented in the middle, forehead on each side with several strong short sharp spines each ending in a fine hair; face and cheeks minutely tuberculated; segments slightly hairy, armed with a dorsal and three lateral rows of long sharp branched-spines. Head black; spines blackish, segments dark purpurescent-black, almost black, paler beneath; with two dorsal and two sublateral slender yellow maculated lines, the subdorsal and sublateral inter-areas being numerous covered with minute yellow spots. (Described from preserved specimen in Rev. J. H. Hocking's Coll.)

PUPA.—Not known.



1.



1b



1a



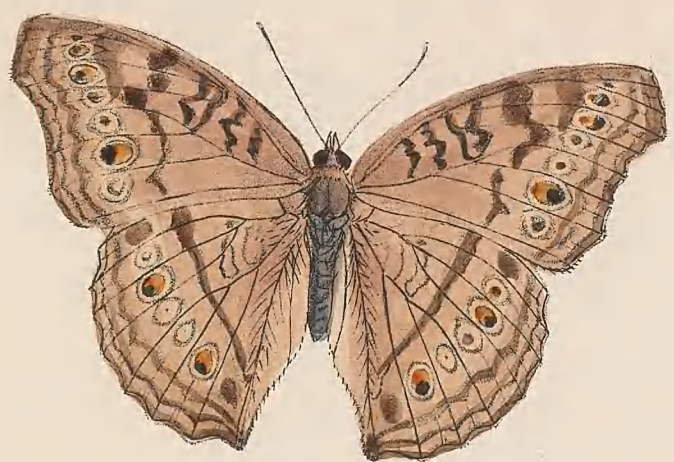
1c



1d



1e



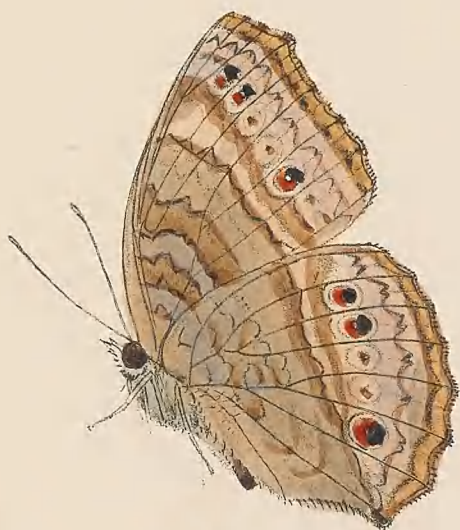
1a



1b



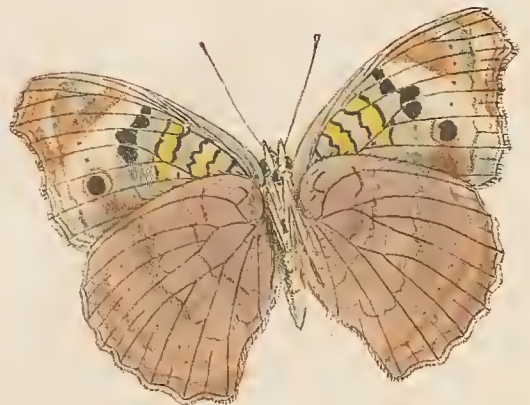
1.



1d



1e





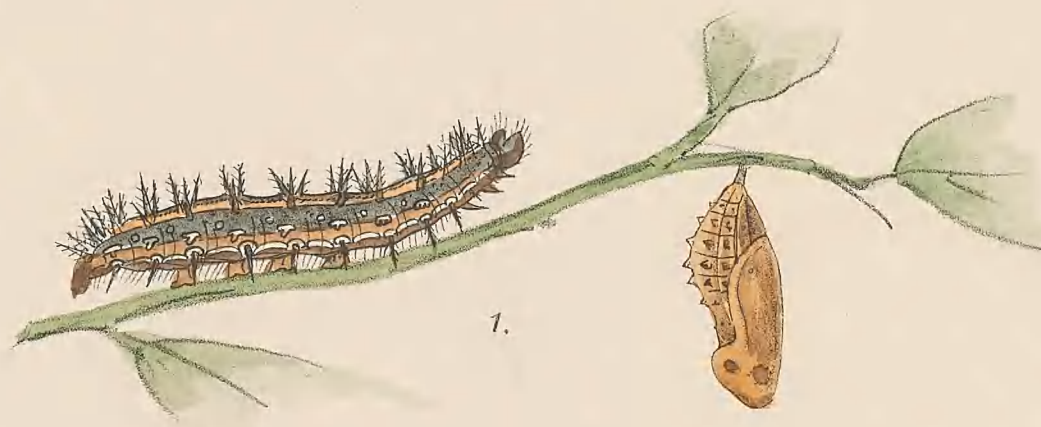
1^a



1^b



1^c



1.



1^d



1^e



J.N. Fitch del. et lith.

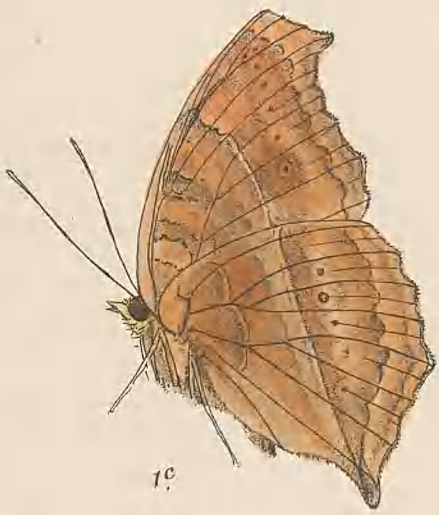
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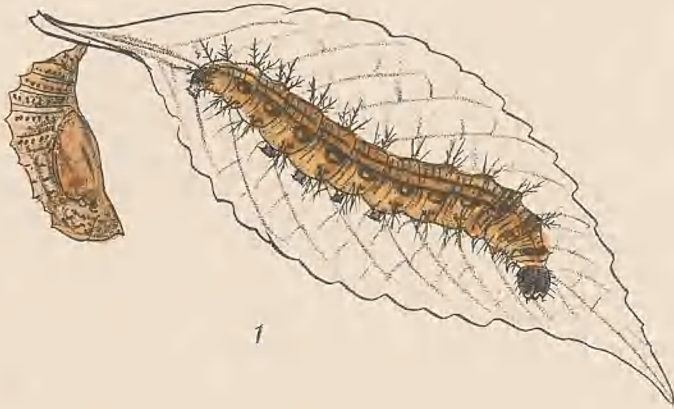
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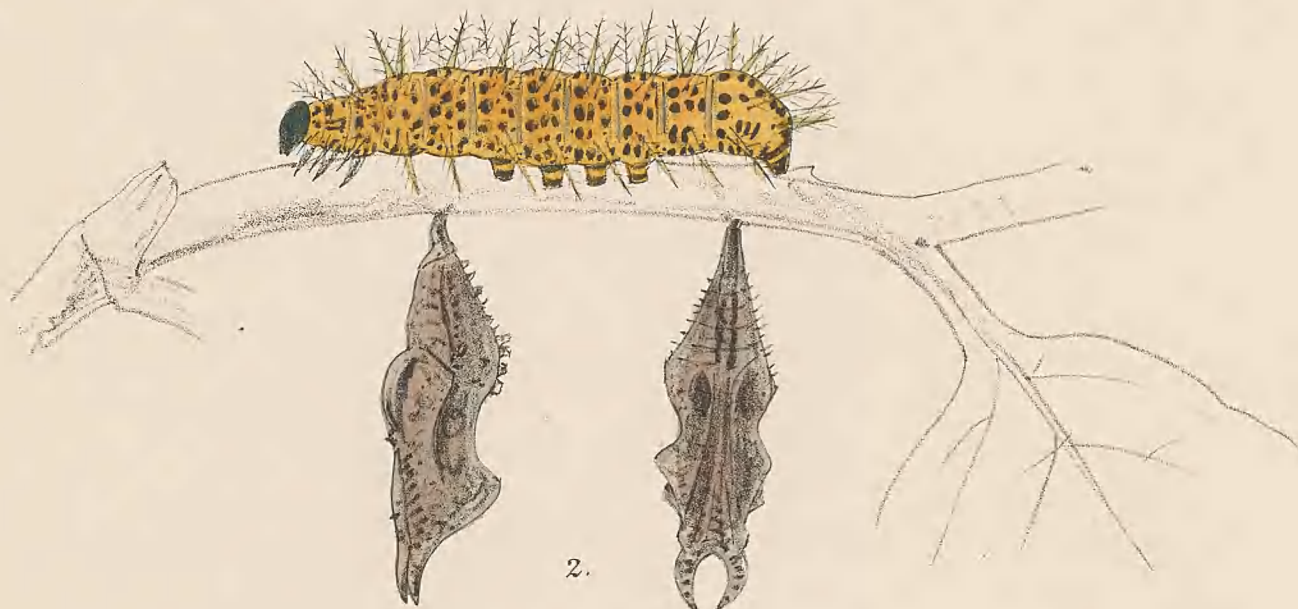
1e



1.



1a



2.



2a



2b



1.



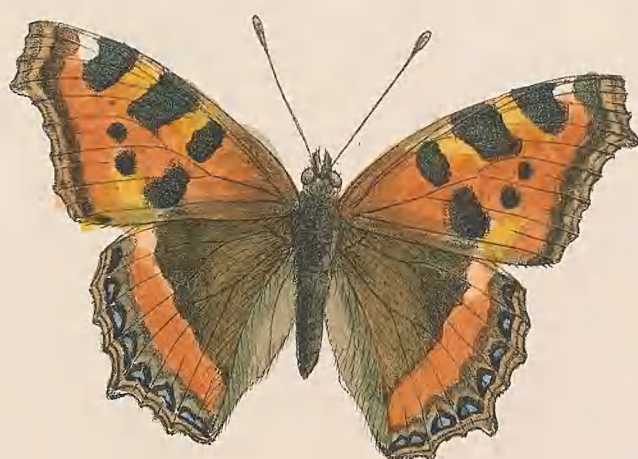
1a



2



2a



3



3a

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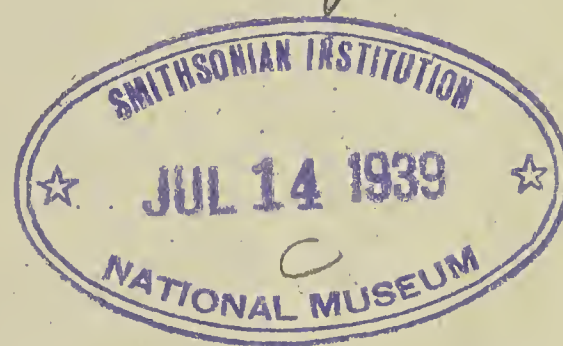
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AGLAIS RIZANA (Plate 317, fig. 1, 1a, ♂ ♀).

Vanessa Rizana, Moore, Proc. Zool. Soc. 1872, p. 559. de Nicéville, Butt. of India, etc., ii. p. 234 (1886).

Nymphalis Rizana, Kirby, Catal. D. Lep. Suppl. p. 733 (1877).

Male and female. Upperside. Differs from *A. Kashmirensis* in being a smaller insect, having the forewing less produced at the apex ; markings and colours disposed as in that species, but more sharply defined, and the colours much brighter. *Fore-wing* with the red colour near the base descending to near the submedian vein ; the posterior black spot being quadrate, well-defined, and broadly bordered outward with clear yellow, this colour also bordering the two upper discal spots, but palest in

the female; submarginal black border narrow and traversed by a single pale lunular line. *Hindwing* with the black base bordered outwardly by clear yellow, the submarginal row of blue-centred black dentate spots slightly, or in most, narrowly bordered inwardly by the dusky band. Underside much darker than in *Kashmirensis*; markings similar.

Expanse, ♂ ♀ $1\frac{8}{10}$ to 2 inches.

HABITAT.—N.-W. Himalayas.

DISTRIBUTION.—The type specimen was taken at Chini, at 9000 feet elevation, Middle Kunawur, in October. Capt. A. M. Lang also obtained it in Kunawur, at 10,000 feet elevation, and Dr. Jerdon at Gulmurg in Kashmir. Capt. H. B. Hellard took it in the "Rupin Pass at about 13,000 feet elevation in September, another seen near top of the Pass, which is about 15,000 feet elevation" (MS. Notes). Col. C. Swinhoe has examples from Kulu. In Mr. J. H. Leech's Collection are specimens from Sultanpur, Kulu, taken by Capt. Graham Young; the Goorais Valley, 7000 feet elevation, Kashmir, taken in June; Dugi Pass, 12,000 feet, taken in August and September by Capt. Thompson, and from the Kuti Pass, 17,000 feet elevation, taken in September by Capt. McArthur. Mr. L. de Nicéville records "a few specimens, obtained from time to time at very high elevations in native Sikkim, by native collectors" (Sikkim Gazetteer, 1894, 145).

AGLAIS LADAKENSIS (Plate 317, fig. 2, 2a, ♂ ♀).

Vanessa Ladakensis, Moore, Annals Nat. Hist. 1878, p. 227; Yarkund Exped. Lep. p. 2, pl. 1, fig. 2 (1879). Elwes, Proc. Zool. Soc. 1882, p. 403. Doherty, Journ. Asiat. Soc. Bengal, 1886, p. 122. de Nicéville, Butt. of India, etc., ii. p. 234 (1886). Elwes, Trans. Ent. Soc. 1888, p. 362.

Male and female. Nearest allied to *A. Rizana*. Both wings with the outer margin less angled. Upperside with similarly-disposed markings, the black markings somewhat duller and less sharply defined and the red colour less intense. *Forewing* with the two upper black bands merging into or being confluent with the discal oblique band below the cell; the outer yellow band from the costa is wider and extends across the wing to the posterior margin, enclosing the two small black discal spots, this band being diffusedly-bordered with red outwardly and inwardly below the median veinlets; the subbasal red band is narrower. On the *hindwing* the black basal area has its discal edge more irregular and more diffusedly yellow-bordered. Other markings similar. Underside. Ground-colour much paler than in *A. Rizana*, the strigæ also paler, the cell interspaces between the bars and the discal transverse fascia of the forewing more defined, the black discal line on hindwing more irregular.

Expanse, ♂ $1\frac{8}{10}$ to 2, ♀ $2\frac{1}{10}$ inches.

HABITAT.—Northern Himalayas.

DISTRIBUTION.—The type specimens were taken at Gogra, Changchenmo, at 15,000 feet elevation, in Ladak, and at the Karatagh Lake, on snow, 16,890 feet elevation, in Yarkund, by the late Dr. F. Stoliczka, during the Indian Government Mission to Yarkund in 1873. In Mr. J. H. Leech's collection are specimens of both sexes from the Kardong Pass, 14,000 feet, in Ladak, taken in August; from the Digha Pass, 15,000 feet, taken in June, and from the Karakorum, 18,000, taken in July, by Capt. McArthur. Examples are in the British Museum from W. Tibet, taken by Capt. Colomb. Mr. P. W. Mackinnon says of it, "Very rare, specimens only obtained on the Nilang Pass, 15,000 feet elevation, in July" (Journ. Bombay N. H. Soc. 1898, 375). Mr. W. Doherty records it from "near Kalapani, Nepalese Tibet, at 14,000 feet elevation, and near Hindi, Chinese Tibet, 15,000 feet elevation. The prehensores are quite different from those of *Kaschmirensis*" (J. As. Soc. Beng. 1886, 122). Mr. H. J. Elwes records it from the "Eastern frontier in Chumbi or Bhotan" (Tr. Ent. Soc. 1888, 363). In the "Sikkim Gazetteer," 1894, 145, it is recorded by Mr. L. de Nicéville as having been "obtained by native collectors only, probably on the other side of the Passes, in Tibet."

CHINA AND JAPAN SPECIES.—*Aglaïs Connexa* (Vanessa Connexa, Butler, P. Z. S. 1881, p. 851. Leech, Butt. China, etc., i. p. 258 (1893). *Habitat.* Japan.—*Aglaïs Chinensis* (Vanessa Chinensis, Leech, Butt. China, etc., p. 258, pl. 25, fig. 1, ♀ (1893). *Habitat.* W. China.

Genus KANISKA.

IMAGO.—Wings rather short and broad. Male. *Forewing* triangular; costa much arched from near the base; apex obtusely pointed; exterior margin slightly oblique, scalloped, angulated outward below the apex and obtusely angled at end of lower median veinlet; costal vein extending to nearly two-thirds the margin; first and second subcostal branches emitted before end of cell; upper discocellular short, middle discocellular concave, lower very oblique and slender. *Hindwing* triangular; anterior margin broadly lobate at the base and thence oblique to the end; exterior margin obliquely convex, scalloped, very slightly excavated below the apex, and with a broad caudate angle at end of upper median veinlet; anal angle lobate; precostal vein bent outward near end; costal vein extending to apex; discocellulars outwardly oblique, lower slender. *Body* very robust; palpi ascending to level of vertex, flattened at the sides and beneath, thickly clothed with short coarse hairy-scales, with a dense ridge of longer hairy-scales on upper edge of second and third joint, edges beneath also hairy. Fore tibiæ and tarsi, in male, densely clothed with short hairy-scales

above and laterally with very fine long silky-outspread hairs; femur with shorter hairs beneath. Fore tibiæ, in female, clothed less thickly with short hairy-scales above and laterally with fewer and shorter fine hairs, tarsus more roughly scaly and with a few short fine hairs only, terminal joints quite apical, their lateral spines short, but stout. Antennæ with a stout cylindrical club. Eyes hairy.

LARVA.—[Haronica]. Somewhat robust; segments armed with longitudinal rows of branched-spines; anal segment slightly humped.

PUPA.—Robust; abdominal segments with two dorsal rows of small pointed tubercles; thorax angular; head-piece produced and bifid.

TYPE.—K. Canace.

NOTE.—The shape of the wings in this genus is similar to that of *Polygonia*, as is also the character and position of the markings on the underside, the markings of the upperside are, however, very different from those in *Polygonia*.

KANISKA CANACE (Plate 315, fig. 1, 1a, ♂ ♀).

Papilio Canace, Johanssen, Amæn. Acad. vi. p. 406 (1764). Linnæus, Syst. Nat. xii. ed. p. 779 (1767).

Vanessa Canace, de Nicéville, Butt. of India, etc., ii. p. 231 (1886). Mackinnon, Journ. Bombay Nat. Hist. Soc. 1898, p. 375.

Nymphalis Canace, Kirby, Catal. D. Lep. App. p. 648 (1871).

IMAGO.—Male. Upperside rich deep blue-black, somewhat glossy, the basal area suffused with dark sap-green; cilia black, alternated with white. *Forewing* with a pale greyish-blue short outwardly-oblique upper-discal band and a transverse outer-discal broad lunular recurved band gradually decreasing in width upward, being slender and brokenly speckled above the median and ending in a small subapical angular spot on the costa; in some specimens a black dot is present in the two lower lunules; outer border with two very ill-defined marginal blue-speckled slender lunular lines; costal edge striated with pale blue. *Hindwing* with a transverse outer discal broad pale greyish-blue band gradually decreasing in width upward and bearing an outwardly-placed series of very small black spots between the veinlets; the two outer marginal blue-speckled lines ill-defined. Underside beautifully variegated, the ground-colour being more or less bright brownish-ochreous, the basal two-thirds prominently edged by a discal black zigzag line, and the outer lunular borders dark greyish-brown or sap-brown, and numerously covered throughout, except at the apices, with short black, violet-grey, and ochreous strigæ; normal cell-marks with brownish-ochreous or grey centres; a small ochreous-white spot at lower end of each cell, the one on the hindwing being the largest and dentate; an outer discal row of black dots, those on the forewing enclosed more or less in a circular area of the ground-

colour and forming obscure ocelli. In some specimens the ground-colour is uniformly purpurescent ochreous-brown and striated with black.

Female. Upperside as in the male, the greyish-blue bands somewhat broader. Underside as in male. *Body* olivescient blue-black, beneath and forelegs dark grey; middle and hindlegs brownish-ochreous; antennæ black above, reddish-ochreous beneath; eyes reddish.

Expanse, ♂ $2\frac{4}{10}$ to $2\frac{6}{10}$, ♀ $2\frac{6}{10}$ to 3 inches.

LARVA.—“Segments alternately orange and white, with numerous black spots on the orange segments, and black streaks on the white; seven white branching black-tipped spines on each orange segment.

PUPA.—Variegated reddish-brown with frontal gold and silver spots; head produced and bifid.” (G. F. Hampson, J. A. S. Beng. 1888, 355.)

HABITAT.—W. and E. Himalayas; Malda; Assam; S. India; Burma.

DISTRIBUTION AND HABITS.—“This very beautiful insect occurs throughout the Himalayas, Bholahat, Malda, in Assam, and in Burma. It is also found in the hills of South India. It has a swift flight, and in the Simla Hills is often found in the bed of a stream, up and down which it flies within a certain limited distance, often settling on a stone with open wings. It frequents paths in forests, occasionally settling on the ground with open wings; if disturbed it settles with closed wings on the bark of a tree, where its rich dark colouring completely hides it” (de Nicéville, *l.c.* p. 232). We possess specimens from Kashmir; Thundiani, taken in September by Col. J. W. Yerbury; Kasauli; Nepal; Khasias, Nilgiris; Wynaad; Shevaroy Hills, and Travancore. Capt. A. M. Lang, in his MS. Notes on the butterflies of the Western Himalayas, says, “This is a thorough forest insect, of swift flight. It is a handsome butterfly on the wing, flashing past, now in the deep shade of the Oak and Rhododendron, now in the broad sunlight, it gleams all blue as a sapphire.” Capt. H. B. Hellard took it in “August and September, in Masuri, the Buspa Valley, and in Kashmir” (MS. Notes). “It is common at Murree in August and September; found along this Hill as far as Thundiana, also at Dewal. It is fond of pitching on the trunks of trees, particularly of the Ilex when the tree has been wounded and the sap is exuding” (Col. J. W. Yerbury, P. Z. S. 1886, 361). It is “common in Masuri and in the interior from May to December. A few also taken in the Dun in October” (P. W. Mackinnon, J. Bombay N. H. S. 1898, 375). Mr. W. Doherty obtained it in “Kumaon generally from 2500 to 8000 feet elevation. Rather rare” (J. As. Soc. Beng. 1886, 122). Mr. H. J. Elwes records it as occurring in “Sikkim, but never commonly, up to 5000 to 6000 feet elevation, during the greater part of the year” (Tr. Ent. Soc. 1888, 362). Mr. G. F. Hampson obtained it in the “Nilgiris, at 3000 to 7000 feet elevation,” and describes both the larva and pupa (J. As. Soc. Bengal, 1888, 355). Col. C. H. E. Adamson records it as “common at Bhamo, Upper Burma,

from October to February, but rarer in the further South" (List Burmese Butt. 1897, 25). Dr. N. Manders found it "not uncommon and widely distributed throughout the Shan States, Burma" (Tr. Ent. Soc. 1890, 525).

KANISKA HARONICA (Plate 315, fig. 2, larva and pupa, 2a, b, ♂ ♀).

Vanessa Haronica, Moore, Proc. Zool. Soc. 1879, p. 137; Lep. of Ceylon, i. p. 49, pl. 25, fig. 2, ♂, fig. 2a, larva and pupa (1881). de Nicéville, Butt. of India, etc., ii. p. 232 (1886).

IMAGO.—Male and female. Upperside deep blue-black; basal areas suffused with dark sap-green. *Forewing* with a greyish-blue continuous curved band medially disposed across the disc, broader than in *Canace*, its upper end being formed by the similar placed upper-discal oblique band of the latter species; a small bluish-white costal lunule before the apex, with a few blue scales scattered marginally below it. *Hindwing* with the greyish-blue band also medially-disposed across the disc, and having a parallel row of small blue-speckled spots disposed beyond its outer border; two slightly-defined blue-speckled marginal lines. Underside beautifully variegated, as in *Canace*, but with all the markings brighter and more distinctly defined.

Expanse, ♂ $2\frac{5}{10}$, ♀ $2\frac{8}{10}$ to $3\frac{2}{10}$ inches.

LARVA.—Light red; spotted with black, the segments divided by blackish and purple lines; anal segment slightly humped; segments armed with eight longitudinal rows of yellow branched-spines; head and legs black. Feeds on *Smilax*.

PUPA.—Reddish-brown; abdominal segments with two dorsal rows of small reddish pointed tubercles; thorax angular; head-piece produced and bifid.

HABITAT.—Ceylon.

DISTRIBUTION.—"Found in hilly country from 2000 to 6000 feet elevation. Very common on pathways or roads bordered by jungle. Occurs all the year round. Larva feeds on the wild yam" (F. M. Mackwood, MS. Notes). Capt. Wade also took it in the "Kottawa Forest, Galle, also at Kandy" (Lep. Ceylon, 49).

INDO-MALAYAN SPECIES.—*Kaniska Charonia* (Pap. Charonia, Drury, Illust. Exot. Ent. i. pl. xv. fig. 1, 2 (1770). Cramer, Pap. Exot. i. pl. 47, fig. A-C (1775). Herbst, Pap. pl. 160, fig. 1, 2 (1794). *Vanessa Charonia*, Godt. Enc. Méth. ix. p. 308 (1819). Kirby, Catal. D. Lep. p. 183 (1871). Elwes, P. Z. S. 1881, p. 898. *Syn.* Pap. Kollina, Meerburgh, pl. 43 (1775). *Van. Canace*, Leech, Butt. China, etc., i. p. 225 (1893). *Habitat.* S. China; Tonkin; Hongkong.—*Kaniska Japonicum* (Pap. No-Japonicum, Siebold, Diss. Hist. Nat. Japon, p. 16 (1824). *Nymphalis* No-Japonicum, Kirby, Catal. D. Lep. Suppl. p. 732 (1878). *Van. Glauconia*, Motschulsky, Etudes Ent. ix. p. 128 (1860). *Van. Canace* (part). Leech, *l.c.* p. 225 (1893). *Habitat.* Japan; Corea.—*Kaniska Perakana* (*Vanessa Perakana*, Distant, Rhop. Malay. p. 430, pl. 40, fig. 1, ♀ (1886). *Habitat.* Malay Peninsula.—*Kaniska*

Battakana (Vanessa Battakana, de Nicéville, Journ. Asiat. Soc. Bengal, 1895, p. 428, ♂ ♀. *Habitat.* N.-E. Sumatra.—*Kaniska Benguetana* (Vanessa Benguetana, Semper, Reis. Phil. Lep. p. 122, pl. 21, fig. 11, 12, ♂ (1888). *Habitat.* Luzon, Philippines.

Genus POLYGONIA.

Polygonia, Hübner, Verz. bek. Schmett. p. 36 (1816). Scudder, Butt. E. U. S. i. p. 309 (1889).

Kirby, Allen's Nat. Hist. Butt. i. p. 86 (1894).

Comma, Rennie, Consp. Butt. p. 8 (1832).

Grapta, Kirby, Faun. Bor. Amer. iv. p. 292 (1837). Stephens, Catal. Brit. Lep. B. M. p. 12 (1850).

Stainton, Manual Brit. Butt. i. p. 40 (1857). Staudinger et Schätz, Exot. Schmett. ii. p. 124 (1887).

IMAGO.—Male. *Forewing* somewhat elongated and narrow, subtriangular; costa slightly arched from near the base and thence straight to near the end, the apex pointed; exterior margin slightly oblique and anteriorly produced obliquely-outward below the apex into a prominent broadly-projecting angle, below which the margin is concave and sinuous, and with a broader projecting angle at end of the lower median veinlet; posterior margin much recurved; costal vein extending to more than half the margin; first subcostal branch emitted at about one-fourth before end of the cell, second at one-eighth before; discocellulars oblique, upper discocellular extremely short, middle concave, lower discocellular straight, slender; median veinlets wide apart; submedian vein slightly recurved. *Hindwing* short, broad, triangular; anterior margin basally lobate and slightly arched towards the apex; exterior margin very oblique, sinuous, excavated below the apex, broadly angular at end of first subcostal, and with a prominent projecting rounded caudate-angle at end of upper median veinlet; anal angle also projected; precostal vein slightly bent or curved outward near tip; cell closed by a slender discocellular veinlet. *Body* very stout; palpi porrect, extending two-thirds beyond the front, compressed at the sides and beneath, densely clothed throughout with rather short hair-scales, the middle and lower joint slightly fringed beneath with fine long hairs, and the middle joint above more densely with stouter hairs; fore tibiæ and tarsi, in the *male*, laxly scaly above, the sides rather thickly clothed with laterally-spreading long, very fine silky hairs; femora beneath with less numerous fine silky hairs; fore tibiæ and tarsi, in the *female*, laxly scaly above, the sides less thickly clothed with shorter silky hairs, apical joints with short stout spines; antennæ with a short stout club; eyes hairy.

LARVA.—Head subquadrate, minutely hairy, vertex slightly depressed in middle, each lobe surmounted with a short tubercular horn, the tip of which is set with hard

spiny-warts; second segment with a transverse row of bristly-warts; third to last segment armed with seven rows of branched-spines.

PUPA.—Head rather flat, with two prolonged straight points in front; back of thorax sharply raised to a thin squared central projection; waist hollowed; abdomen with a bold dorsal curve; a subdorsal row of nine small points; wing-cases prominent, shoulders angulated, their lower ends humped (Buckler).

TYPE.—P. C-album.

POLYGONIA VAU-ALBUM (Plate 317, fig. 3, 3a, ♂).

Papilio Vau-Album, Denis et Schieffermüller, Wien. Verz. p. 176 (1776). Fabricius, Mant. Ins. ii. p. 489 (1787). Hübner, Eur. Schmett. i. fig. 83, 84 (1793). Ochsenheimer, Schmett. Eur. i. pt. i. p. 112 (1807).

Pap. Polychloros, Cramer, Pap. Exot. iv. pl. 330, fig. C, D (1782), *nec* Linn.

Pap. L. album, Esper, Schmett. i. pt. ii. pl. 62, fig. 3, a, b (1780).

Vanessa Vau-album, Godart, Enc. Méth. ix. p. 306 (1819). de Nicéville, Butt. of India, etc., ii. p. 236 (1886).

Nymphalis Vau-album, Kirby, Catal. D. Lep. Suppl. p. 773 (1877).

IMAGO.—Male and female. Upperside deep fulvous; cilia black, alternated with white. *Forewing* with a black constricted spot obliquely across middle of the cell, a large quadrate spot at its end, extending from the costa to upper median veinlet, and bordered on each side with a pale yellow diffused costal patch, a discal quadrate black spot between upper and middle median veinlets, two black spots between the middle and lower medians, and two wider separated spots between the lower median and submedian vein; the basal area and posterior margin sprinkled with olivescent-fuscous scales; a broad black apical patch bearing an outer pure white costal spot; the outer margin broadly black and traversed by two indistinct ochreous lines. *Hindwing* with a large irregularly-quadrangle black spot extending from middle of the costa to discoidal veinlet and outwardly bordered by a quadrate white spot; outer margin with a broad decreasing black band enclosing a more or less distinct series of small rounded spots paler than the ground-colour, the extreme outer margin being dark fulvous and traversed by two ochreous lines, the inner one most distinct. Underside more or less dusky brownish-ochreous or ochreous-brown. Both wings with the basal half dark ochreous-brown and transversely marked more or less with dense-black or dark-brown strigæ, its discal edge sharply defined by a very irregular angulated black line; the discal area less numerously marked with paler brown irrorations and strigæ, and traversed by an outer series of black dots; the outer margins sinuously dark brown, with a medial inner black band bearing a bluish line and two outer indistinct pale ochreous lines. *Forewing* also with a short

dark brown basal oblique cell-streak and a zigzag bar across middle of the cell, the latter with its upper end outwardly white bordered; outer edge of the discal angulated line also white bordered; the apical spot beyond also white. *Hindwing* with a small prominent pure white widely-spread V-shaped mark at lower end of the cell. *Body* above olivescence-brown, beneath brown; palpi above black, sides and beneath edged with ochreous-white; legs blackish above, ochreous-white beneath; antennæ black above, beneath and tip ochreous.

Expanse, ♂ $2\frac{6}{10}$ to $2\frac{8}{10}$, ♀ $2\frac{8}{10}$ inches.

HABITAT.—Kashmir; Chitral; N. Asia; C. Russia; E. Europe.

DISTRIBUTION.—“Dr. T. C. Jerdon took two fine specimens at Gulmurg, 9000 feet elevation, in Kashmir. It has also been taken at Sonamurg, Kashmir” (de Nicéville, *l.c.* 236).

Our illustration on Plate 317, fig. 3, 3a, is from a Kashmir male in our own collection.

POLYGONIA C-ALBUM.

Papilio C-album, Linnæus, Syst. Nat. x. ed. p. 447 (1758). Esper, Schmett. i. pl. 13, fig. 3 (1777); *id.* pl. 59, fig. 3 (1780). Hübner, Eur. Schmett. i. fig. 92, 93 (1794).

Vanessa C-album, Godart, Enc. Méth. ix. p. 302 (1819). Herr. Schäffer, Eur. Schmett. i. fig. 159, 160 (1844). de Nicéville, Butt. of India, ii. p. 237 (1886).

Nymphalis C-album, Kirby, Catal. D. Lep. Suppl. p. 732 (1877).

Wet-season form (Plate 318, fig. 2, 2a, b, c, ♂ ♀).

IMAGO.—Male. Upperside deep bright fulvous-red; cilia black, alternately edged with fulvous-grey. *Forewing* with two deep black rounded spots obliquely across middle of the cell, a large quadrate discocellular streak extending from the costa to upper median, three discal oblique quadrate spots, and a subapical black patch decreasing from the costa to near upper median; outer margin black and linearly speckled outwardly with fulvous-grey scales, and bordered inwardly by a series of yellow dentate spots. *Hindwing* with the costal base broadly black, and the outer margin very broadly fulvescent-black, the latter traversed by a row of five distinct yellow small dentate spots; abdominal border greyish-brown; a black quadrate spot at end of the cell, a larger spot above it between the subcostals, and a much smaller spot between the upper and middle medians. Underside with the basal area and outer marginal border greyish sepia-brown; the discal area dark grey, divided from the dark base by a sharply-defined broken irregular black line; outer areas and base of hindwing numerously covered with fine black strigæ; discal area traversed by a very indistinct row of blackish dots. *Forewing* also with an oblique black loop-mark from lower base of cell, some black strigæ from the costa, and a black lunular streak between the angles of the outer margin. *Hindwing* also with a prominent white comma-shaped mark at end of the cell.

Female. Upperside as in the male, except that on the forewing the discocellular black streak is broader, and the subapical streak fulvous posteriorly; and in the hindwing the marginal dentate yellow spots are somewhat larger. Underside as in the male; the outer area duller grey, the strigæ less prominent, and the white comma-shaped mark more or less ill-defined.

Expanse, ♂ $2\frac{2}{10}$, ♀ $2\frac{4}{10}$ inches.

Dry-season form (Plate 318, fig. 2, d, e, ♀).

Male and female. Upperside fulvous-yellow; markings as in the wet-season form, but the black spots somewhat smaller and less sharply defined, the yellow dentate spots also less defined. Underside paler than in wet-season form, the ground-colour being dull ochreous greyish-brown; markings similar.

Expanse, ♂ $1\frac{2}{10}$, ♀ $2\frac{4}{10}$ inches.

HABITAT.—Europe; Asia Minor; Persia; Western Himalayas.

DISTRIBUTION WITHIN OUR AREA.—We possess specimens of the *wet-season* form from Gulmurg and Sunamurg, Kashmir, taken by Capt. A. M. Lang, and of the *dry-season* form from Kashmir, taken by Capt. R. Bayne Reed. Capt. Lang records it as “apparently common at Gulmurg, Kashmir” (Ent. Monthly Mag. 1868, 34). Mr. J. H. Leech has specimens from Kylang, 13,000 feet elevation, taken by Capt. MacArthur in September, from Gurais Valley, 7000 feet, Kashmir, taken by himself in September; from Dugi Pass, 12,000 feet elevation, near Karakorum, taken in August and September by Capt. Thompson.

Of our illustrations on Plate 318, figs. 2, 2a, b, c, are from *wet-season* male and female Kylang specimens in Mr. Leech’s collection, and figs. 2d, e, from *dry-season* female from Kashmir, taken by Capt. Reed.

POLYGONIA COGNATA.

Wet-season form (Plate 319, fig. 1, 1a, ♂).

IMAGO.—Male and female. Upperside similar to, but of a paler fulvous than, *C-album*, as here described. *Forewing* with the cell spot united and larger, the discocellular streak broader, the lower discal spot larger and with a small speckled-spot above it. *Hindwing* with the discal spots larger; the outer marginal band broader, more uneven on its inner edge and traversed by an almost continuous series of narrow yellow lunules. Underside with the ground-colour throughout uniformly dark greyish sepia-brown, the strigæ less sharply defined, white comma-shaped mark prominent.

Expanse, ♂ 2, ♀ $2\frac{2}{10}$ inches.

Dry-season form (Plate 319, fig. 1, b, c, d, ♂ ♀).

Male and female. Upperside fulvous-yellow; markings as in wet-season form; the black markings less sharply defined, the marginal bordering yellow dentate spots on the forewing less distinct, and the yellow lunules on the hindwing broad and continuous. Underside with the ground-colour dull yellowish-ochreous or pale brownish-ochreous, the markings dark ochreous-brown; comma-shaped mark prominent.

Expanse, ♂ 2, ♀ $2\frac{2}{10}$ inches.

HABITAT.—Western Himalayas; Kashmir, Kunawur, Kumaon.

DISTRIBUTION.—We possess specimens of the *wet-season* form from Thundiani, taken by Col. J. W. Yerbury in September; from Kashmir, taken by Major H. B. Hellard in August and September, and also both sexes of the *dry-season* form from the Simla Hills, Kunawur, taken by Capt. A. M. Lang, and from Kashmir, taken by Capt. Magee. Specimens from Thundiani are also in the collection of the British Museum and of Col. Swinhoe. Capt. A. M. Lang refers to this species under *C-album*, as “occurring rarely in Kumaon, where he took it at several localities far apart, and of divers altitudes and climates. One fine specimen was taken on the bleak Hungrung Pass at about 15,000 feet elevation, while others were taken 200 miles away on the lower well-wooded ranges of the Simla District” (Ent. Mo. Mag. 1868, 34). Col. J. W. Yerbury took his specimens at “Thundiani, a Hill Station near Abbottabad, at about 8700 feet elevation, in August and September. It affects the Yarrow and Ragwort” (Ann. Nat. Hist. 1888, 139). Mr. W. Doherty probably refers to this species, under *C-album*, as being taken by him at “Khati, N.W. Kumaon, at 8000 feet elevation” (J. A. S. Beng. 1890, 122). Mr. J. H. Leech has it from Sultunpur, Kulu, taken by Capt. Graham Young.

POLYGONIA AGNICULA.

Grapta Agnicula, Moore, Proc. Zool. Soc. 1872, p. 559 (♂ only).

Nymphalis Agnicula, Kirby, Catal. D. Lep. Suppl. p. 733 (1877).

Vanessa C-album, var. *tibetana*, Elwes, Trans. Ent. Soc. 1888, p. 363, pl. 10, fig. 1, ♂.

Vanessa C-album (part), de Nicéville, Butt. of India, etc., ii. p. 237 (1886).

Wet-season form (Plate 319, fig. 2, 2a, ♂).

Male and female. Upperside bright clear fulvous-red. *Forewing* with prominent black markings disposed as in Kashmir *C-album*, the two cell-spots being well-separated and small, the marginal black band slightly speckled outwardly with fulvous-grey scales, the inner row of yellow dentate spots, seen in *C-album* and *cognata*, are absent. *Hindwing* with three black discal spots, the two lower being

well isolated, the costal border black; the marginal black band traversed by broad lunules of the same bright fulvous as the ground-colour, and also outwardly speckled with fulvous-grey. Underside greyish sepia-brown, brownest on the basal areas, the outer areas numerous covered with very fine black strigæ and traversed by a discal row of slightly-perceptible black dots with pale borders; comma-shaped mark slender.

Expanse, ♂ ♀, 2 to $2\frac{2}{10}$ inches.

Dry-season form (Plate 319, fig. 2, b, c, ♂).

Upperside clear fulvous-yellow; of a uniform tint throughout; marginal lunules on the hindwing of the same colour; black markings somewhat larger. Underside dark ochreous-brown, darker throughout than in *wet* form of *cognata*.

Expanse, 2 inches.

HABITAT.—Nepal; Chumbi, Sikkim; N. W. Bhotan.

DISTRIBUTION.—The type specimens of *agnicula* were taken at Katmandu, in Nepal, by the late Major-Gen. G. Ramsay. Mr. H. J. Elwes records his type of *tibetana* as having been taken by native collectors in Chumbi and N. W. Bhotan (Tr. Ent. Soc. 1888, 363). Mr. W. Doherty (J. A. S. Beng. 1886, 122) records *agnicula* as having been taken by himself on the Pindari Glacier, 12,000 feet elevation, and Byans Valley, in Eastern Kumaon, 12,000 to 15,000 feet elevation, and remarks, "These species (*C-album* and *Agnicula*) are closely allied, but I have been able to separate my own specimens by means of slight differences in the prehensores, as well as by the shape and colouring."

Our illustrations of this species on Plate 319, figs. 2, 2a, are from a Nepal type of *Agnicula* (*wet-season* form); and figs. 2b, c, from a male *dry-season* form, from Chumbi, kindly given to me by Mr. Elwes.

POLYGONIA INTERPOSITA (Plate 318, fig. 1, 1a, ♂, ♀).

Vanessa interposita, Staudinger, Stettin Entom. Zeit. 1881, pp. 286–7.

Vanessa Egea, de Nicéville, Butt. of India, etc., ii. p. 237 (1886), *nec* Cramer.

IMAGO.—Male and female. Upperside deep dusky-fulvous; cilia black and alternately edged with grey. *Forewing* with two outwardly-oblique superposed small black spots across middle of the cell, a broad black discocellular streak at its end extending from the costa to upper median veinlet, and three discal inwardly-oblique small spots, the upper two being much the smallest in the male, and the upper one almost obsolescent; a dusky-castaneous oblique patch before the apex, its costal end being broadly black; a broad blackish outer-marginal border very indistinctly

traversed by a fine dusky fulvous line and inwardly bordered by a series of small yellowish dentate spots disposed between the veins. *Hindwing* with the costal base broadly dull greyish-black, the outer margin broadly dull greyish-black anteriorly merging to dark fulvous-brown posteriorly, and traversed by a row of five small yellowish dentate spots; the costal interspace between the dark basal border and the outer band being grey-speckled; at the upper end of the cell is a small narrow black spot, and a larger black spot above it between the subcostals. Underside. Both wings pale purpurescent greyish-brown, darkest basally and on outer borders; numerous covered with transversely disposed fine black strigæ, which are most conspicuous across the disc. *Forewing* also with the discal strigæ separated from the dark basal area by an irregular black discal line, and from the outer margin by a narrow black lunular medial fascia speckled with greenish-grey scales, and two upper series of black dentate marks and a lower inner series of similar marks; from the lower base of the cell extend two oblique fine black looped-lines. *Hindwing* also with the discal strigæ separated from the basal dark area by a slender black interrupted line, which is bent upward above the anal angle and thence extends angularly up the abdominal margin; the outer margin traversed by a series of black dentate marks speckled with greenish-grey scales; at lower end of the cell is a pure white angled-mark like an oblique letter L. *Body* and palpi above olivescence-brown, beneath and legs pale brownish-grey; palpi externally edged with black; front and middle legs lined with black above; antennæ black above, ochreous beneath.

Expanse, ♂ $1\frac{7}{10}$, ♀ $2\frac{1}{10}$ inches.

HABITAT.—Persia?; Beluchistan; Chitral; Turkestan.

The above description and figures are taken from Chitral specimens in the collection of Mr. H. Grose-Smith, and differ from South European and Asia Minor examples of *Egea* in having the ground-colour of the upperside darker, the markings and marginal bands also being darker. A male, from Turkestan, in Mr. J. H. Leech's collection, agrees perfectly with the above. A female, from Quetta, Beluchistan, taken at 6500 feet elevation, and described by Mr. de Nicéville (*l.c.* p. 237) is stated to "differ from European examples of *Egea* in lacking the two round black spots on the disc of the forewing on the upperside, but there are traces of these spots, there being spots in their place of a deeper shade of fulvous than the ground-colour."

INDO-MALAYAN SPECIES.—*Polygonia C-aureum* (Pap. C-aureum, Linn. Syst. Nat. i. p. 477 (1758). *Syn.* Pap. Angelica, Cram. iv. pl. 388, fig. G, H (1782). *Habitat.* China, Formosa, Japan.—*Polygonia Bockii* (Grapt. Bockii, Rothschild, Nov. Zool. i. p. 535, pl. 9, fig. 7 (1894). *Habitat.* W. China.—*Polygonia Pryeri* (Vanessa Pryeri, Jansen, Cist. Ent. ii. p. 269, pl. 5, fig. 2 (1878), Leech, Butt.

China, etc., i. p. 267, pl. 25, fig. 4, ♂. *Habitat.* Japan.—*Polygonia Fentoni* (Van. Fentoni, Butler, Cist. Ent. ii. p. 281 (1878). *Habitat.* Japan.—*Polygonia lunigera* (Van. lunigera, Butler, P. Z. S. 1881, p. 850. *Habitat.* Japan.—*Polygonia Hamigera* (Van. Hamigera, Butler, Ann. Nat. Hist. 1877, p. 92. *Habitat.* Japan.—*Polygonia gigantea* (Grapta gigantea, Leech, Ent. 1890, p. 189; Butt. China, etc., i. p. 263, pl. 25, fig. 6, ♀ (1893). (*Wet-season form.*) *Syn.* *Polygonia extensa* (Grapta C. album, var. *extensa*, Leech, Butt. China, etc., i. p. 265, pl. 25, fig. 5, ♀ (1893). (*Dry-season form.*) *Habitat.* W. and C. China.

Genus VANESSA.

- Vanessa*, Fabricius, Syst. Gloss (Illiger's Mag. vi. p. 281 (1807). Latreille, Consid. Gén. p. 440 (1810). Hübner, Verz. Schmett. p. 33 (1816). Curtis, Brit. Ent. pl. 96 (1825). Scudder, Syst. Rev. Amer. Butt. p. 2 (1872); *id.* Butt. E. U. S. i. p. 430 (1889).
- Pyrameis*, Hübner, Verz. Schmett. p. 33 (1816). Doubleday and Hewits. Gen. D. Lep. p. 202 (1849). Stephens, Catal. B. Lep. B. M. p. 11 (1850). Moore, Lep. Ceylon, i. p. 49 (1880). Staudinger et Schätz, Exot. Schmett. ii. p. 125 (1887). Kirby, Allen's N. H. Butt. i. p. 96 (1894).
- Bassaris*, Hübner, Exot. Schmett. ii. *id.* Index, p. 4 (1816-21).
- Amiralis*, Rennie, Consp. Butt. p. 10 (1832).
- Cynthia*, Stephens, Illust. B. Ent. Haust. i. p. 47 (1827). Rennie, Consp. p. 10 (1832). Westwood, Brit. Butt. p. 56 (1841). Stainton, Manual Brit. Butt. i. p. 36 (1857).
- Phanessa*, Sodoffsk. Bull. Mosc. x. p. 80 (1837).
- Neopyrameis*, Scudder, Butt. E. U. S. i. p. 434 (1889).

IMAGO.—Male. *Forewing* triangular; costa slightly arched, exterior margin oblique and slightly angular below the apex, scalloped; posterior margin straight; costal vein extending to two-thirds the margin; first and second subcostal branches emitted at equal distances close before end of the cell, third at nearly half length beyond, fourth and fifth at two-thirds beyond; upper discocellular very short, middle short and curved outward, lower discocellular long, slender, recurved obliquely outward; radials from angle near subcostal and end of middle discocellular; cell broad; middle median emitted at one-fifth before lower end of the cell, lower at one-half its length; submedian vein almost straight. *Hindwing* short, triangular; exterior margin convex, scalloped, abdominal margin long; costal vein extending to apex; precostal vein bent abruptly outward, emitted at a short distance beyond base of subcostal; first subcostal branch emitted at two-thirds from its base; upper discocellular slightly convexly-oblique, lower slender, very oblique and straight; radial from end of upper discocellular; cell broad; two upper median branches from end of cell, lower at one-third before its end and opposite second subcostal; submedian

recurved; internal vein recurved from the base. *Body* stout, abdomen short; palpi porrect, compactly clothed with short appressed hairs at sides and beneath, second joint long and projecting half its length beyond the head, third joint short, pointed; fore tibiæ and tarsi in the *male* somewhat scaly above, the sides very densely clothed with laterally spreading long coarse silky hairs, femora beneath with less numerous shorter hairs; fore tibiæ and tarsi, in the *female*, somewhat scaly above, the sides less densely clothed with long coarse silky hairs, apical joints spined; antennæ long, with a short thick cylindrical club; eyes hairy.

LARVA.—Cylindrical, delicately hairy; armed with a dorsal and five incomplete lateral rows of branched-spines; head slightly subquadrate, vertex depressed in middle, regularly covered with minute tapering warts; hairy.

PUPA.—Head-piece obtuse, bluntly cleft; thorax dorsally raised and angled near the middle; abdomen dorsally arched, and with a dorsal row of conical points and lateral rows of lesser points.

TYPE.—V. Atalanta.

VANESSA INDICA (Plate 320, fig. 1, 1, a, b, ♂ ♀).

Papilio Atalanta Indica, Herbst, Nat. Schmett. vii. p. 171, pl. 180, fig. 1, 2 (1794).

Pyrameis Indica, Kirby, Catal. D. Lep. p. 185 (1871). Moore, Lep. of Ceylon, i. p. 50, pl. 27, fig. 2 (1881). de Nicéville, Butt. of India, ii. p. 229, pl. 18, fig. 74, ♀ (1886).

Papilio Atalanta, Cramer, Pap. Exot. i. pl. 84, fig. E, F (1775), *nec* Linn.

Hamadryas decora Calliroë, Hübner, Samuel Exot. Schmett. (1806–16).

Pyrameis Calliroë, Hübner, Verz. bek. Schmett. p. 33 (1816). Doubleday and Hewits. D. Lep. p. 204. Moore, Catal. Lep. Mus. E. I. C. i. p. 138 (1857).

Vanessa Calliroë, Gray, Lep. of Nepal, p. 11 (1846).

Pyrameis nubicola, Fruhst. Berl. Ent. Zeit. 1898, p. 151.

IMAGO.—Male and female. Upperside. *Forewing* black, with a broad medial outwardly-oblique irregular red band, the lower portion of which is traversed by three irregular-shaped black patches; basal area and posterior margin golden-brown; an oblique inner subapical series of white quadrate spots and an outer subapical series of small white dentate spots. *Hindwing* golden-brown, with an olivescient or purplish gloss in certain lights; costal border greyish-ochreous; an outer marginal red band inwardly-bordered by black conically-lunate spots, and traversed by a row of black lunulate spots and outer marginal line. Cilia alternated with white. Underside. *Forewing* similar to upperside, except that the base of costa is striated with black, the apex broadly ochreous-brown and with two small ocelli below the white dentate spots, a partly blue and whitish marginal line, a blue-

speckled costal stripe beyond the cell, and a black patch crossed by a white bar at end of the cell. *Hindwing* beautifully marked with rich dark reddish-brown transverse sinuous fasciæ with pale ochreous borders, which are numerous speckled with greyish-white and black scales; the veins from the base also lined with greyish-white; two white-edged blackish marks within the cell and a larger similar mark beyond the cell; outer disc traversed by a series of cordiform ocellate reddish spots with blue and black-speckled centres, followed by a submarginal blue-speckled blackish lunular line and a narrower similar marginal line. Body above olivaceous golden-brown; palpi above blackish, beneath pale ochreous, the sides being white; legs pale ochreous, femora beneath black-speckled with white; antennæ black above, beneath and tip reddish-ochreous.

Expanse 2 to 3 inches.

LARVA.—Head black, minutely tuberculated. Segments slightly hairy, armed with a dorsal and three lateral rows of branched-spines; spines mostly black; segments blackish, numerous covered with very small yellowish spots. (Described from preserved specimens in Coll. Hocking.)

HABITAT.—W. and E. Himalayas; Assam; Naga Hills; Burma; Bombay; Nilgiris; Ceylon; China; Japan.

DISTRIBUTION, ETC.—“This is a common species wherever the food plant, the nettle, is found. It occurs commonly in the Himalayas up to considerable elevations. I possess a curious aberration, taken in the Deyra Dun, in July, by Col. Buckley, which almost exactly agrees with a variety of the European species (*Atalanta*) figured by Herbst (pl. 180, fig. 5, 6)” (de Nicéville, Butt. Ind. ii. 229). “It is very common in the late summer and autumn months throughout the N. W. Himalayas, and hibernated specimens are met with in the spring” (*id.* Indian Agriculturist, Jan., 1880). Col. J. W. Yerbury found it “common at Thundiani, the Hill Station above Abbottabad, in May, August, and September” (Ann. N. H. 1888, 139). Capt. A. M. Lang found it “abundant in the W. Himalayas from 5000 to 10,000 feet elevation. Larvæ taken at Kasauli on nettle, in June and July” (MS. Notes). Mr. P. W. Mackinnon says it is “more common in Masuri than *Cardui*, but is comparatively rare in the Dun. The larvæ feed on different species of Urticaceæ, and is gregarious. It flies almost throughout the year” (J. Bombay N. H. Soc. 1897, 375). Major J. L. Sherwill, in his Journal of a trip in November in the Sikkim Himalayas, says this butterfly “was common at great elevations. I observed it on the snow, and on the glaciers at 13,000 feet to 16,000 feet elevation, but it was the sole inhabitant of these cold and dreary regions” (J. A. S. Bengal, 1882, 479). “Not uncommon in Sikkim, in open ground, at all seasons and elevations up to 12,000 feet elevation” (H. J. Elwes, Tr. Ent. Soc. 1888, 362). Col. C. Swinhoe records taking “several examples in Bombay in 1877” (P. Z. S.

1885, 128). Col. C. H. E. Adamson says it is "rarely taken in the Arakan Hills and at Bhamo" (List, 1897, 25). Dr. N. Manders took "one specimen at Bernardmyo, Shan States, Burma" (Tr. Ent. Soc. 1890, 524). In Ceylon, Mr. F. M. Mackwood says it is "rarely seen under 4000 feet elevation. Settles on pathways or open ground. Very swift of flight. Larvæ feeds on Nettle (*Urtica neilgherriensis*)."

Capt. Hutchison "found it at all times in forest land, from 3000 to 6000 feet. Commonest at the highest elevation" (Lep. Ceylon, i. 50).

VANESSA CARDUI (Plate 320, fig. 2, 2a, b, ♂ ♀).

- Papilio Cardui*, Linnæus, Syst. Nat. x. ed. p. 475 (1758); *id.* xii. ed. i. 2, p. 774 (1767). Esper, Schmett. i. pt. 1, pl. 10, fig. 3 (1777). Hübner, Eur. Schmett. i. fig. 73, 74 (1793).
- Vanessa Cardui*, Hübner, Verz. bek. Schmett. p. 33 (1816).
- Pyrameis Cardui*, Moore, Catal. Lep. Mus. E. I. C. i. p. 138, pl. 5, fig. 3, 3a, *larva* and *pupa* (1857); Lep. of Ceylon, i. p. 50, pl. 27, fig. 1, 1a (1881). de Nicéville, Butt. of India, etc., ii. p. 227 (1886). Staudinger et Schätz, Exot. Schmett. ii. p. 125 (1887). Leech, Butt. of China, etc., i. p. 251 (1893).
- Cynthia Cardui*, Stephens, Ill. Brit. Ent. Haust. i. p. 47 (1827). Horsfield, Desc. Catal. Lep. E. I. C. pl. 7 (1829). Westwood, Gen. Syn. p. 87 (1840). Crotch, Cist. Ent. i. p. 66 (1872).
- Neopyrameis Cardui*, Scudder, Butt. E. U. S. i. p. 434 (1889).
- Papilio Carduelis*, Cramer, Pap. Exot. i. pl. 26, fig. E, F (1775).

IMAGO.—Male and female. Upperside. Ground-colour reddish-ochreous, basal areas olivescens-ochreous-brown; cilia black, alternated with white. *Forewing* with an outwardly-oblique black irregular-shaped broken band crossing from middle of the cell to the disc above the submedian vein; the apical area from end of cell and the exterior border also black; before the apex is a short white outwardly-oblique streak and a curved row of four round spots, the second and third being small; a marginal pale lunular line with its upper portion most defined and whitish. *Hindwing* with a blackish patch from the costal vein across end of cell, a partly confluent recurved discal band, a submarginal row of lunules, and then a marginal row of somewhat scutiform spots; between the discal band and submarginal lunules is a row of five round black spots, which in some examples show a pale and dark outer ring. Underside. *Forewing* brighter reddish-ochreous, the apical area and outer margin much paler, the apex being olivescens ochreous-brown; discal irregular band as above, subapical white streak, row of spots and marginal lunules distinct; base of wing and interspace before end of cell white. *Hindwing* transversely marbled with olivescens ochreous-brown and speckled with black scales; crossed by basal and discal sinuous whitish or pale fasciæ and intersected by white veins; an outer-discal row of five ocelli, the upper one smallest and usually imperfect, the

second and fifth the largest, the fourth with black centre speckled with blue and ringed with yellow, and the second and fifth also with an outer black ring; submarginal lunules purpurescent-grey, bordered by a whitish fascia; outer margin ochreous. *Body* olivescient ochreous-brown, abdomen with ochreous bands; palpi blackish above, white beneath; body beneath and legs greyish-white; antennæ black above, tip and beneath reddish.

Expanse, $2\frac{2}{10}$ to $2\frac{6}{10}$ inches.

LARVA.—“*After first moult*; three-quarters of an inch long; ground-colour olive-brown, variegated with brown; dorsal line double, interrupted and white; lateral line faint, interrupted and red-brown; sides pale slate colour, and very spiny; abdomen pale slate colour, ventral line darker; prolegs slate colour; thoracic legs black and shiny; anal pair slate colour; head black and spiny; stigmata white, bordered with black; armed with five rows of slate coloured branched-spines, one dorsal and two lateral. *After last moult*; length one inch. Cylindrical and spiny. ground-colour and markings as after first moult.”

PUPA.—“Golden olive-green, with a lilac iridescence; a dorsal row of protuberant gold spots, and on either side one of same, and also broad longitudinal bands of gold colour on the sides.” (Chaumette, Lucknow, MS. Notes.)

HABITAT.—Throughout India; Burma; Ceylon; Andaman and Nicobar Isles; Malay Peninsula, etc.

DISTRIBUTION, HABITS, ETC. Within our Area.—“In India this butterfly occurs almost everywhere. It is decidedly rare in Calcutta, but as far as I am aware it occurs plentifully in every other part of India and in the Hills up to a considerable elevation. It has been found in both the Andaman and Nicobar groups of Islands” (L. de Nicéville, Butt. India, ii. 228). “This is one of the first insects you will meet with in the spring, in the W. Himalayas, and the last you will see in the autumn. It is an early riser, and one of the last to go to rest. I have actually watched them follow the setting sun as its beams gradually ascended the hillsides, caused by the sun setting behind an opposite range of hills. I have taken specimens in the plains as far east as Dinapore, but [up to the present date] I have never seen any in Calcutta. It also occurs commonly in Kashmir, and I have taken it high up in Ladak” (*id.* Indian Agric. January, 1880). Capt. A. M. Lang found it “everywhere common in the Western Himalayas at all seasons, and throughout the winter months in the plains” (MS. Notes). The Rev. J. H. Hocking found the “larva on Nettle; May and August, in Kulu, at 6200 feet elevation” (P. Z. S. 1882, 240). “Very common almost throughout the year in Masuri and the Dun. Larva feeds on thistles and on *Debregeasia bicolor*, N. O. Urticaceæ” (P. W. Mackinnon, J. Bombay N. H. Soc. 1898, 375). Mr. L. de Nicéville records that it was “found near Jarti Gumbaz, Pamir” (Rept. on Pamir Boundary Comm. 1898, p. 15). Col. C. Swinhoe obtained

“a few at Kandahar in October and November in 1880. It was very plentiful in March and April following. The gardens about Kandahar were alive with regular swarms of this butterfly in the last month, but I did not observe it at Quetta or anywhere else on our lines of communication between Sibi and Kandahar” (Tr. Ent. Soc. 1885, 339). At Karachi it was plentiful in several months of the year. I took it in January, February, June, July, August, and December” (*id.* P. Z. S. 1884, 505). Capt. H. L. De la Chaumette reared the “larva at Lucknow, in October, 1860, on *Gnaphalium indicum*, the imago emerging on November 15th” (MS. Notes). “In Sikkim, this cosmopolitan butterfly is found throughout the year at low elevations, but more commonly in the winter. In the summer it is found up to 12,000 feet elevation” (de Nicéville, Sikkim Gaz. 1894, 144). In Bombay “it is found sparingly throughout the District. At times it appears in great numbers, continues for a week or two, and disappears again. As is well known, it is a migratory butterfly, and is known in almost every part of the world. It has a rapid, irregular flight, and is fond of settling on the ground, and on rocks. We have found larvæ in Kanara in November, feeding on *Zornia diphylla*, and on a thistle-like plant of the genus *Blumea*, which is its common food in other parts of the Presidency also” (J. Davidson and E. H. Aitken, J. Bombay N. H. Soc. 1896, 256). “The larvæ are social when very young, half a dozen living together under the shelter of a little network of silk. The butterfly is not very easy to catch, being a strong flier and wary. It rarely settles, except on the ground, and opens its wings much less than the *Junonias*” (E. H. Aitken, *id.* 1886, 131). “At different times of the year, but most often, I think, in June, large numbers of this butterfly appear about the rocks on the sea-shore, or in other barren situations, and I am inclined to think they are new arrivals from some other country. A certain number remain permanently with us, and breed on a common species of *Blumea*” (*id.* 1897, 337). In Ceylon, “it is found everywhere, but is more plentiful in the higher districts” (F. M. Mackwood, Lep. Ceyl. i. 50). “In Burma this is a rare butterfly. I took one in February near Bhamo, and one in December in North Yen. I have received it from the Chin Hills, and saw one so far South as Mandalay, in January. One was also obtained at Nimbu” (Col. C. H. E. Adamson, List, 1897, 25). Mr. W. L. Distant records it from Penang (Rhop. Malay. Preface, p. vi.). We have examples from Sumatra, Java, Formosa, and Japan. Mr. J. J. Walker, R.N., found it “not very common in Hong Kong from December to May” (Tr. Ent. Soc. 1895, 457). Mr. J. H. Leech also obtained it in China and Japan. It is also recorded from the Philippines.

INDO-MALAYAN SPECIES.—*Vanessa Dejeanii*, Godart, Enc. Méth. ix. Suppl. p. 821 (1823). Boisd. Spéc. Gén. Lep. i. pl. 10, fig. 2 (1836). *Habitat.* Java.—*Vanessa Samani* (Pryameis Samani, Hagen, Iris, vii. p. 359 (1894). *Habitat.* Sumatra.

Genus ARASCHNIA.

Araschnia, Hübner, Verz. bek. Schmett. p. 37 (1816). Doubleday and Hewits. Gen. D. Lep. p. 187 (1848). Staudinger and Schätz, Exot. Schmett. ii. p. 123 (1887). Leech, Butt. China, etc., i. p. 267 (1892).

IMAGO.—Male. Wings moderately small. *Forewing* elongatedly triangular; costa very slightly arched, apex rounded, exterior margin oblique, sinuous, slightly convex below the apex, posterior margin slightly recurved; costal vein extending to about three-fifths the length; cell extending to nearly half the wing; first subcostal emitted at about one-sixth before end of the cell, short and running close to the costal near its end, and in some specimens slightly anastomosed to it close to its end; upper discocellular extremely short and outwardly-oblique, middle discocellular erect and concave, lower discocellular outwardly-oblique; middle median emitted at some distance before lower end of the cell, lower median at half distance before end of cell; submedian vein slightly recurved. *Hindwing* small, conically-triangular; anterior margin almost straight from basal lobe, apex rounded, exterior margin convex and sinuous, abdominal margin somewhat convex, anal angle pointed; precostal vein straight; radial emitted near the base of subcostal branch; cell open. *Body* moderately slender; eyes hairy; head hairy in front; palpi rather slender, third joint rather long, pointed, smooth, second joint clothed with fine longish hairs beneath and above, sides smoothly scaled; fore tarsi in male clothed with fine long silky laterally-divergent hairs; fore tarsi in female slender, smooth, joints spined at tip beneath.

LARVA.—Head with two erect branched-spines. Segments with a dorsal, and lateral rows of branched-spines.

PUPA.—Head-piece short, cleft; thorax dorsally angled; abdomen with a dorsal and a shorter lateral row of points.

TYPE.—A. *Levana*.

SEASONAL DIMORPHISM.—In the European species, *Levana* is now known to be the *spring* form and *Prorsa* the *summer* form of one species.

ARASCHNIA DOHERTYI (Plate 320, fig. 3, 3a, b, ♂ ♀).

Araschnia Prorsoides, Elwes, Proc. Zool. Soc. 1891, p. 285, pl. 27, fig. 5, 6, ♂ ♀ (*nec* Blanchard).

IMAGO.—Male. Upperside dark purpurescent-brown; cilia black, alternated with ochreous-white. *Forewing* with two, or three, pale reddish-ochreous speckles within the base of the cell, a slender curved streak and two straight streaks across the middle of cell, followed by an upper wedge-shaped ochreous spot near end of the cell; below the cell is a short slender ochreous streak and an outer

obsolescent dot; across the disc are two upper-discal outwardly-oblique pale ochreous-yellow broad spots, a very small outwardly-oblique spot below, two small rounded inwardly-oblique superposed white spots which are outwardly placed above and below the upper median veinlet, followed by three lower-discal broad quadrate large ochreous spots, the lower being narrow; beyond is a submarginal irregularly-disposed series of small markings, of which the upper are macular and pale ochreous-yellow, the next a reddish-ochreous broken lunule, then a pale yellow short lunule, and lastly two lower reddish-ochreous narrow lunules. *Hindwing* crossed by a medial-discal broad pale ochreous-yellow band, and a submarginal reddish-ochreous very narrow lunular band, between which is a very slender discal broken sinuous line; base of wing with a slightly-defined pale yellow dot above the cell and two very slender curved lines across the cell. Underside. Ground-colour pale yellowish-ochreous; the discal band, as above, ochreous-white; basal irregular markings dark ochreous-red narrowly edged with yellow, the veins basally also yellow; discal area medially clouded with dark ochreous-red and traversed by an inner slender sinuous black-edged yellow line and an outer diffused yellow lunular line, followed by two marginal slender black lines; a medial series of lilacine-white dots, the middle pair on the forewing being the largest and represent those of the upperside.

Female. Upperside with markings as in the male, but somewhat broader. *Forewing* also with a small red spot beyond the cell. *Hindwing* also with an outer-discal reddish-ochreous slender lunular line. Underside similar to the male. *Body* dark olivescence-brown; palpi above black; body and palpi beneath and legs pale ochreous-white; antennæ black above, whitish beneath, tip ochreous.

Expanse, ♂ 2, ♀ $2\frac{2}{10}$ inches.

HABITAT.—Naga Hills.

DISTRIBUTION.—Mr. W. Doherty "found it abundantly above Mao, on the Manipur side of the Nagar Hills, at 6000 to 8000 feet elevation, in August and September, 1889, where it was common in open ground near water, the larva feeding on a species of Nettle" (H. J. Elwes, *l.c.*).

CHINA AND JAPAN SPECIES.—*Araschnia prorsoides* (Van. *Prorsoides* et *Levanoides*, Blanchard, Compt. Rend. Acad. Sci. 1871, p. 810). Leech, Butt. of China, etc., i. p. 273, pl. 26, fig. 1, 2, ♂ ♀. *Syn.* A. *Strigosa*, Alpheraky, Rom. Mem. v. p. 111, pl. 5, fig. 6 (1889). *Habitat.* W. China.—*Araschnia obscura*, Fenton, P. Z. S. 1881, p. 850. *Syn.* A. *Levana*, Leech, *l.c.* p. 269, pl. 26, fig. 9. *Habitat.* Corea; Yesso, Japan.—*Araschnia Burejana*, Bremer, Bull. Acad. Petr. (1861), p. 466; *id.* Lep. Ost-Sib. p. 15, pl. 1, fig. 8 (1864). Leech, *l.c.* i. p. 271, pl. 26, fig. 10—14 (1892). Pryer, Rhop. Nippon, p. 25, pl. 5, fig. 11 (1888). *Syn.* A. *Strigosa*, Butler, Journ. Linn. Soc. Zool. 1866, p. 54. *Habitat.* Amur Land, W. China,

Corea, Japan.—*Araschnia Doris*, Leech, *l.c.* i. p. 272, pl. 26, fig. 4, 5, ♂ ♀ (1892). *Habitat.* W. and C. China.—*Araschnia Fallax*, Janson, *Cist. Ent.* ii. p. 271, pl. 5, fig. 3 (1878). Pryer, *Rhop. Nippon*, p. 24, pl. 5, fig. 12, ♀. *Habitat.* Japan.—*Araschnia Davidis*, Poujade, *Bull. Soc. Ent. Fr.* 1885, p. 114. Oberthür, *Et. Ent.* 1890, p. 38, pl. 9, fig. 102 (1890). Leech, *l.c.* p. 274. *Habitat.* Moupin, W. China.—*Araschnia Oreas*, Leech, *l.c.* i. p. 275, pl. 26, fig. 6, ♂ (1892). *Habitat.* W. China.

Genus SYMBRENTHIA.

Symbrenthia, Hübner, *Verz. bek. Schmett.* p. 43 (1816). de Nicéville, *Butt. India, etc.*, ii. p. 238 (1886). Distant, *Rhop. Malay.* p. 431 (1886). Staudinger and Schätz, *Exot. Schmett.* ii. p. 123 (1887).

Laogona, Boisduval, *Spéc. Gén. Lep.* i. pl. 10, fig. 3 (1836). Doubleday and Hewits, *Gen. D. Lep.* i. p. 190 (1848).

IMAGO.—Male. Wings short. *Forewing* triangular; costa slightly arched; apex obtuse, exterior margin slightly oblique and uneven, posterior margin slightly recurved; costal vein rather stout, extending to beyond middle of the margin; first subcostal branch emitted at one-third before end of the cell, second branch at one-ninth before the end, third at fully one-third beyond the cell, fourth and fifth at two-thirds; upper discocellular short and outwardly-oblique, middle concave, lower rather slender and outwardly-oblique; middle median veinlet at considerable distance from lower end of cell, lower median at fully half from the end; submedian vein straight. *Hindwing* triangular; costa prominently arched at the shoulder, apex obtusely rounded; exterior margin oblique, slightly sinuous and with a projecting prominent angle at end of upper median, anal angle pointed; precostal vein bifid, radial emitted close to base of subcostal branch; cell open. *Body* stout; palpi ascending, projecting half beyond the front, clothed with rather closely-appressed long scales, second joint more hairy above; *forelegs in male*—femur scaly, tibia and tarsus laxly clothed with long fine silky-hairs which are longest on the tarsi; femur longer than tibia, the tibia and tarsus of equal length; *forelegs in female*—femur, tibia and tarsus very slender, scaly, very sparsely fringed on their outer side with a few very fine longish hairs; tibia and tarsus of equal length, tarsus four-jointed, second, third, and fourth joint armed beneath with a few minute spines and two stronger spines at the apex; antennæ with a short obtuse club; eyes hairy.

LARVA.—Body cylindrical; head flattened in front, vertex broad and sharply depressed in the middle, minutely hairy, cheeks slightly tuberculous; third to last segment armed with a dorsal and four lateral rows of rigid branched-spines on each side.

PUPA.—Suspended by tail. Thorax and abdomen laterally protuberant in front; with an antero-dorsal and thoracic pointed prominence; abdominal segments with a row of dorsal and lateral small points; head-piece projected and widely cleft.

TYPE.—*S. Hippoclus*.

DISTRIBUTION OF GENUS.—This is a truly oriental genus, being found, in India throughout the Himalayas, Assam, and the Eastern Ghats; in Burma, Upper Tenasserim, Malay Peninsula and Archipelago, extending to the Philippine Islands and W. and C. China, but does not occur in Ceylon, the Andaman or Nicobar Islands.

SEASONAL VARIATION.—The species of this genus, occurring within our area are, apparently, all seasonally variable, the markings of the upperside, in both sexes of the *wet-season* broad, being narrow and brightly-coloured, and in those of the *dry-season* brood broader, more irregularly-shaped, and paler in colour. In a Philippine species (*S. Anna*, Semper) the sexes are dimorphic—the male having red bands and the female ochreous-white bands,—and in *S. dissoluta*, Stgr., from Palawan, the bands in male are red, and in female almost white. In the Java species (*S. Javanus*)—figured in Hübner's Exot. Schmett.—the male has red bands, and the female is stated to be dimorphic, some having red bands, others pure white bands.

SYMBRENTHIA LUCINA.

Wet-season form (Plate 321, fig. 1, larva and pupa; fig. 1a b, c, ♂ ♀).

Symbrenthia Khasiana, Moore, Proc. Zool. Soc. 1874, p. 569, ♂ ♀. de Nicéville, Butt. of India, etc., ii. p. 241 (1886).

Symbrenthia Hippoclus, Moore, Proc. Zool. Soc. 1882, 243, pl. 11, fig. 4, 4a. de Nicéville, Journ. As. Soc. Bengal, 1882, p. 57. Butt. of India, etc., ii. p. 240 (1886). Doherty, *id.* 1886, p. 122.

Distant, Rhop. Malay. p. 431, pl. 42, fig. 4, 5, ♂ ♀ (1886). Leech, Butt. China, etc., i. p. 284.

Symbrenthia Asthala, Leech, *l.c.* pl. 25, fig. 2, ♂.

IMAGO.—Male. Upperside fulvescent-black, with pale fulvous bands. Cilia alternated with white. *Forewing* with an elongated rather narrow irregular clavi-form discoidal band, its upper edge indented before and at end of the cell, its lower edge including and slightly bordering the median vein; a subapical oblique sinuous band extending to the costa, its lower portion being usually broken in two, but sometimes coalescent, above its end there is generally a very small attached spot and always a slender apical lunule; below is an oblique discal band, which is constricted at the lower median veinlet, its upper portion being quadrate and sometimes with a very small attached spot at its outer lower angle. *Hindwing* with a short basal costal patch, a rather broad discal band, which is narrowest anteriorly and widens suddenly on the abdominal margin; a much narrower submarginal

band gradually attenuating and ending at the upper subcostal veinlet, its inner edge sinuous and sometimes anteriorly dotted with black; followed by a marginal more or less interrupted fine line. Underside pale fulvous or yellowish-ochreous, marked with dark ferruginous short streaks and spots almost throughout, those across the disc of both wings assuming the form of a somewhat conspicuous darker band, which band, on the forewing, has a pale violet streak bordering its lower inner end. *Forewing* also with the outer-discal markings forming two submarginal continuous ill-defined sinuous lines, between which is a series of small indistinctly-defined ocellate spots, the one between the upper and middle median being the most distinct and with a violet-speckled centre. *Hindwing* also with the outer-discal markings forming two submarginal continuous ill-defined sinuous lines, between which is a row of very indistinctly-formed conical spots, those from the discoidal veinlet to the anal angle being broadest and with their shape obliterated by numerous bluish-violet speckles, some of these speckles being also scattered above the abdominal angle; outside these spots is a marginal lunular line, the lunule above the caudal angle being speckled with bluish-metallic scales. *Thorax* above olivescens-brown, abdomen black with a broad pale fulvous band; frontal tuft fulvous; palpi above blackish; body and palpi beneath, and legs, pale yellowish-ochreous; antennæ black, annulated with pale ochreous beneath, tip fulvous.

Female. Upperside with all the bands as in male, but slightly broader and paler. Underside with the ground-colour paler; all the markings as in male, but clearer and better defined. *Body* as in male.

Expanse, ♂ $1\frac{8}{10}$, ♀ $2\frac{2}{10}$ inches.

Dry-season form (Plate 321, fig. 1, d, e, f, g, ♂ ♀).

Papilio Lucina, Cramer, Pap. Exot. iv. p. 82, pl. 330, fig. E, F, ♀ (1780).

Symbrenthia Daruka, Moore, Proc. Zool. Soc. 1874, p. 570, pl. 66, fig. 10, ♂.

Male. Upperside. Both wings with all the bands much broader and somewhat paler than in wet-season form. *Forewing* with the discoidal band coalescing at its upper and lower end with subapical and discal band, the two latter bands also partially coalesced, and the subapical band also with the apical streak; the lower outer angle of the discal band extending to the posterior angle. *Hindwing* with the discal and submarginal band coalesced on the abdominal border; some transverse short slender streaks also extending from the former to the latter between their upper end; marginal interrupted line distinct. Underside paler and with all the markings less defined than in wet-season form.

Female. Upperside with all the bands broad and coalescent, as in male, but with paler central areas. Underside with the ground-colour pale and the markings less defined, as in male.





1.



1a



2



2b



2a



2c



2d



2e



1.



1b



1a



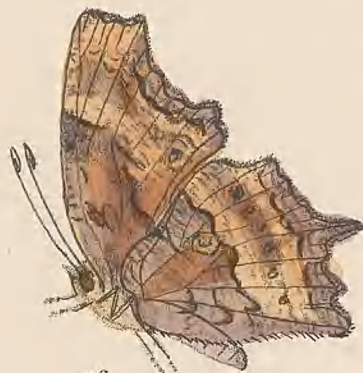
1c



1d



2a



2c



2.



2b



1.



1^a



2^b



1^b



2.



2^a



3.



3^b



3^a

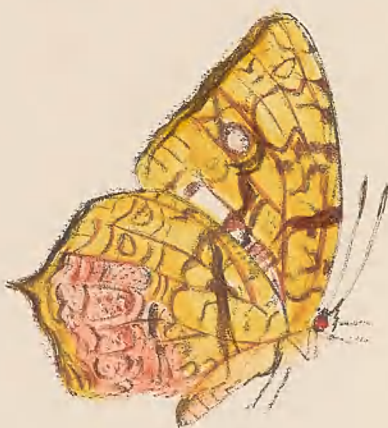




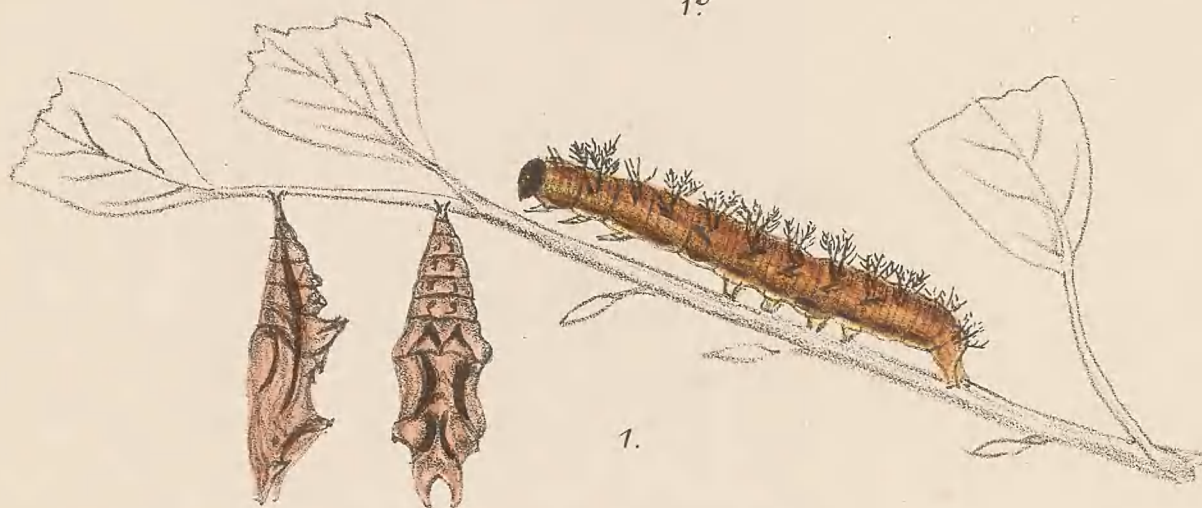
1a



1b



1c



1.



1d



1g



1e



1f



1.



1^c



1^a



1^d



1^b



1^f



1^g



1^h



1^e



1.



1b



1a



1c



1e



1d



2a



2



2b



1a



1b



1c



1d



1e



1f



1g



1h

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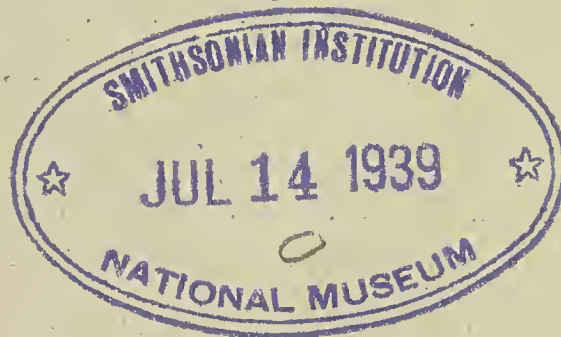
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Expanse, ♂ $1\frac{7}{10}$, ♀ 2 to $2\frac{2}{10}$ inches.

LARVA.—Body cylindrical. Head black, flattened in front, vertex broad and sharply depressed in the middle, minutely hairy, cheeks slightly tuberculous; third to the last segment armed with a dorsal and four lateral rows of black rigid branched-spines on each side; segments fuliginous-black; second segment with a slender pale ochreous dorsal line, third to last segment with two dorsal and two sublateral rows of small pale ochreous spots.

PUPA.—Suspended by tail. Pale purpurescent-ochreous; thorax and abdomen laterally protuberant in front; with a thoracic and anterior-dorsal pointed prominence; abdominal segment with a row of dorsal and lateral small points; head-piece projected and widely cleft. (Described from preserved specimens in Coll. Hocking.)

HABITAT.—W. and E. Himalayas; Assam; Khasias; Burma; Tenasserim; Malay Peninsula; S. China.

DISTRIBUTION.—We possess specimens of both the wet and dry season form from Kasauli, N.W. Himalayas, Nepal; Sikkim; Bhotan; Khasia Hills (Swinhoe); Karen Hills, Burma; and W. China. In the British Museum are examples from the Kali Valley, Kumaon; Landoor; Sikkim and Bhotan, taken in March and April by Mr. G. C. Dudgeon; Tilin Yaw, Burma, taken by Capt. E. Y. Watson in February; Karen Hills taken in December; Thoungyeen Valley, March (Capt. C. T. Bingham); Hong Kong (J. J. Walker, R.N.); Colonel C. Swinhoe has received numerous examples from the Khasia Hills. Mr. L. de Nicéville records it as "the widest spread species of the genus and the most abundant in individuals where met with. It occurs in India throughout the Himalayas and Assam to Upper Tenasserim" (*l.c.* 241). "Fairly common, in the W. Himalayas, in the beds of streams during the summer and autumn" (*id.* Ind. Agriculturist, 1880). The Rev. J. H. Hocking found the larva feeding on Nettle, in August, at 6200 feet elevation, in the Kangra Hills. Mr. P. W. Mackinnon says "it occurs somewhat commonly at Masuri and in the interior from April to October. The larva feeding on *Debregeasia bicolor*, N.O. Urticaceæ, and is gregarious" (J. Bombay N. H. Soc. 1898, 376). Mr. W. Doherty says it is "found, commonly, in low country and river valleys in Kumaon, as far up as the Dhoaj, 6500 feet elevation. I have also taken it in the Eastern Ghats of the Indian Peninsula, in the districts of Ganjam and Vizagapatam" (J. A. S. Bengal, 1866, 122). It is "common in Sikkim, up to about 6000 feet elevation, all through the warm months. The larva feeding on *Girardinia heterophylla*" (L. de Nicéville, Sikkim Gaz. 1894, 145). Col. C. H. E. Adamson says it is "fairly common in Lower Burma, but is not common in Upper Burma, though on two successive days I took about a dozen at one spot near Sayaing, in January (List Burm. Butt. 1897, 25). Mr. W. L. Distant records it from "Perak, Malay Peninsula" (Rhop. Malay. 431).

Mr. J. H. Leech has several examples of both forms—which we have verified—from Omeishan, W. China, and from Ichang, C. China. Mr. J. J. Walker found it common in Hong Kong from December to May. Fresh specimens being on the wing in February (Tr. Ent. Soc. 1895, 458).

We have adopted Cramer's name *Lucina*, being the oldest, given by him to his figure of the Chinese female of the dry-season form of this species.

Of our illustrations on Plate 321, fig. 1 represents the larva and pupa from the Rev. J. H. Hocking's Kulu collection; figs. 1 a, b, c, male and female of the *wet-season* form (being the types of *Khasiana*), and figs. d, e, f, g, the male and female of the *dry-season* form (fig. e being the type of *Daruka*).

SYMBRENTHIA COTANDA.

Wet-season form (Plate 322, fig. 1, 1a, b, ♂, 1c, d, ♀).

Laogona Hypselis, Doubleday and Hewits. Gen. D. Lep. i. p. 191, pl. 25, fig. 1, ♂ (1847)—*nec* Godart.

Symbrenthia Hypselis, de Nicéville, Butt. India, etc., ii. p. 341 (1886). Elwes, Trans. Ent. Soc. 1888, p. 364. Swinhoe, Trans. Ent. Soc. 1893, p. 288. Staudinger and Schätz, Exot. Schmett. ii. p. 123, pl. 16 (1887).

Symbrenthia Sinis, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, p. 357, pl. F, fig. 9, ♂.

IMAGO.—Upperside. Both wings dark fulvescent-black; cilia alternated with yellow. *Forewing* with a rich dark fulvous, rather narrow discoidal streak extending along lower half of the cell to beyond its end, its upper edge irregularly waved or slightly sinuous, the end truncate between base of upper and middle medians, its lower edge also waved or slightly extending sinuously below the median vein, the basal area of the wing being also tinged with fulvous; a subapical short oblique angular streak divided into two portions by the lower radial, and with a small spot sometimes present disposed inwardly above it; a lower-discal inwardly-oblique band from below middle median to the posterior margin. *Hindwing* with a rich dark fulvous inwardly-oblique narrow irregular-edged short medial-discal band with sometimes a small paler costal spot above it; beyond is a submarginal broader band attenuating anteriorly and ending at the lower subcostal, and an obsolescent fulvous slender marginal line sometimes present from the anal to near outer angle; abdominal margin broadly to the submedian fulvescent-yellow basally and greyish-brown posteriorly, with the blackish bars of the underside slightly visible; the hairy clothing of the lower-discal area from the base dark fulvous. Underside. Both wings pale olivescence-yellow, with a submarginal and marginal very slender black line. *Forewing* with the costal area and from below the cell obliquely across the disc to near middle of the outer margin tessellated with short black marks; the lower

area of the cell and posterior border being white, the lower cell area and median interspaces blotched with pale fulvous. *Hindwing* with the basal area and lower-discal area tessellated with black marks divided by a whitish transverse medial interspace representing the band of the upperside; beyond is a submarginal series of five metallic-green conical spots, each being thickly powdered with black scales and edged with black, the whole series encompassed by a fine black line, the veins between the spots being also black lined; bordering these spots is an inner black lunular line, and outwardly a marginal row of metallic-green black-speckled lunules, the three lowest lunules from the anal angle being broad, a similar lunule also present at the abdominal angle. *Body* above black; thorax thickly clothed with iridescent green and fulvous hairs, abdomen with fulvous segmental bands; head above black, front whitish; palpi above black, pale yellow beneath; body beneath and legs pale yellow; abdomen beneath with lateral black spots; antennæ black above, whitish beneath.

Female. Upperside duller fulvescent-black; all the bands yellowish-ochreous. *Forewing* with the discoidal band as in male; the subapical streak continued to the costa and having a minute spot also present outside its lower end, with which it is sometimes coalescent, a small apical streak also above it; outer band the same as in male. *Hindwing* with the discal band narrow as in male, the blackish tessellate marks of the underside being very slightly visible basally; outer-discal band narrower; marginal disconnected line slightly apparent. Underside as in the male.

Expanse, ♂ $1\frac{8}{10}$ to $2\frac{2}{10}$, ♀ $2\frac{2}{10}$ inches.

Dry-season form (Plate 322, fig. 1, e, ♂, 1, f, g, h, ♀).

Symbrenthia Cotanda, Moore, Proc. Zool. Soc. 1874, p. 569, pl. 66, fig. 9, ♂. de Nicéville, Butt. India, ii. p. 242 (1886); *id.* Sikkim Gazetteer, 1894, p. 145.

MALE.—Upperside duller fulvescent-black than in *wet-season* form. Both wings with all the bands broader, more irregular in shape, and of a somewhat paler fulvous. *Forewing* with the broad discoidal band diffusedly extending brokenly below the cell towards the posterior margin and partly coalescing with inner end of the outer band, the subapical band composed of three conjoined portions. *Hindwing* with the discal band extending broadly to the costal edge, where it is pale yellow; the outer band broader and more irregularly-edged; the fulvous marginal disconnected line from anal angle distinct, its upper end joined to the discal band. Underside similar to *wet-season* form.

Female. Upperside. Ground-colour dark fulvescent-brown; the black tessellate markings of the underside being more or less partially visible; the bands yellowish-ochreous with paler central areas, broader and more irregularly-edged than

in female of wet-season form. *Forewing* with the discoidal band slightly confluent with lower end of subapical band; the apical streak longer and narrow; the lower band very broad, its upper irregular end sometimes almost touching the subapical band. *Hindwing* with the discal band very broad, its central area pale yellow; tessellate marks of underside slightly visible; outer band broad, its upper end extending inward and sometimes joined to the discal band; marginal line extending to apex. Underside paler throughout than in *wet-season* form.

Expanse, ♂ $1\frac{8}{10}$ to $2\frac{2}{10}$ inches.

HABITAT.—W. and E. Himalayas; Assam; Khasia and Naga Hills; Burma; Tenasserim; Malay Peninsula.

DISTRIBUTION.—Mr. W. Doherty records it as being “common in the Kali Valley, 2000 to 4000 feet elevation in Eastern Kumaon” (J. A. S. Beng. 1886, 122). Mr. L. de Nicéville says it is “not nearly so common as *Hippoclus* [Lucina]. It has a habit of flying backwards and forwards in a narrow gorge between rocks in one of the mountain streams so common in the Himalayas, and occasionally settling on the overhanging foliage” (Indian Agriculturist, 1880). We possess the wet and dry-season forms from Nepal, Sikkim, and the Khasia Hills. Col. C. Swinhoe has both forms from the Khasias, and males of the wet form from Kaschmir. Mr. L. de Nicéville records it also from “Bhotan, Assam, Naga Hills, Cachar, Karen Hills, Burma, and Malay Peninsula” (J. Bombay N. H. S. 1891, 357). “It is the commonest species of the genus in Sikkim, and is found up to 4000 feet elevation almost throughout the year” (*id.* Sikk. Gaz. 1894, 145). Mr. H. Grose-Smith has it from the Ruby Mines, Burma. Specimens from the Thoungyeen Valley, Upper Tenasserim, taken in November and February, by Capt. C. T. Bingham, are in the British Museum.

SYMBRENTHIA BRABIRA.

Wet-season form (Plate 323, fig. 1, 1a, ♂, 1, b, c, ♀).

Symbrenthia Asthala, Moore, Proc. Zool. Soc. 1874, p. 269, pl. 43, fig. 9, ♂. Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 122. de Nicéville, Butt. of India, etc., ii. p. 244, pl. 23, fig. 106, ♂ (1886).

IMAGO.—Male. Upperside rich fulvescent-black; the bands of the same rich dark fulvous, as in male of *S. Cotanda*, and of the same shape but not so broad as in the dry-season form of the latter species. Underside nearly uniformly bright ochreous-yellow; tessellated marks smaller, narrower, and more widely apart than in wet-season form of *S. Hysudra*; the submarginal conical spots on the hindwing small, imperfectly formed and slightly speckled with metallic-green scales; marginal lunules continuous and metallic-green speckled.

Female. Upperside with slightly paler bands than in male. *Forewing* with the discoidal band somewhat narrower, the other bands slightly broader, the subapical band reaching the costa, and with two very small apical spots above its end. *Hindwing* with both bands somewhat narrower than in male. Underside as in the male.

Expanse, ♂ $1\frac{8}{10}$, ♀ 2 inches.

Dry-season form (Plate 323, fig. 1, d, e, ♂).

Symbrenthia Brabira, Moore, Proc. Zool. Soc. 1872, p. 558. de Nicéville, Butt. of India, etc., ii. p. 244 (1886).

Male. Upperside duller fulvescent-black and the bands paler than in *wet-season* form. Both wings with very broad irregularly-edged bands, broader than in dry-season *S. Cotanda*; the discoidal band on forewing diffused hindward below base of the cell. Underside bright ochreous-yellow; tessellated marks somewhat narrower and less perfectly formed than in the *wet-season* form; the submarginal series of spots on hindwing not conically defined, each being formed by an upper and lower short lunate line, the centres being very sparsely metallic speckled.

Expanse, ♂ $1\frac{7}{10}$ inch.

HABITAT.—Western Himalayas.

DISTRIBUTION.—We possess the type specimen (*Asthala*), the *wet-season* form, taken in Kaschmir by Capt. R. Bayne Reed, and also that of the dry-season form (*Brabira*). Mr. P. W. Mackinnon says, it is “rather rare in Masuri, but flies from April to September. It occurs also in the Tehri Garhwal and the Upper Ganges Valley” (J. Bombay N. H. Soc. 1898, 376). Mr. W. Doherty (J. A. S. Bengal, 1886, 122) records it from the “Pindari Valley, N.W. Kumaon, at 7000 feet elevation.”

NOTE.—*Brabira* being the oldest name, takes precedence of that given to the *wet-season* form. We have not seen a female of the dry-season form.

SYMBRENTHIA SIVOKANA.

Wet-season form (Plate 323, fig. 2, 2a, ♂; 2b, ♀).

IMAGO.—Male. Upperside rich dark fulvescent-black; the bands rich dark fulvous, similar to those in *wet-season S. Asthala*; the bands on forewing somewhat shorter. Underside light yellow with defined intervening patches of ochreous-yellow between the markings; both wings with all the markings very slender. *Hindwing* with the submarginal row of conical spots very small and having pale yellow centres, their inner-edge only being slightly speckled with bluish-grey scales; the lower

marginal lunules and the lunule at abdominal angle slender and bluish-grey speckled.

Female. Upperside with the bands as in male, of the same colour and width. *Forewing* also with a small spot above outer end of subapical band. Underside of the same pale yellow ground-colour and defined patches of bright ochreous-yellow as in male; the tessellate markings broader; the submarginal row of conical spots on hindwing with clear pale centres as in male; the marginal lunules also the same as in male.

Expanse, ♂ $1\frac{6}{10}$, ♀ $2\frac{2}{10}$ inches.

HABITAT.—Sikkim.

DISTRIBUTION.—Under the name *S. Asthala* Mr. L. de Nicéville refers to this species as having "been brought in considerable numbers in April, May and October, from native Sikkim by native collectors. It is very plentiful at Sivoke in March" (Sikkim Gazetteer, 1894, 145). Specimens of both sexes from Sivoke, Sikkim, taken in March and May by Mr. G. C. Dudgeon, are in the British Museum. Other examples are in our own collection, and also in that of Mr. P. Crowley and Mr. H. Grose-Smith.

SYMBRENTHIA HYSUDRA.

Symbrenthia Hysudra, Moore, Proc. Zool. Soc. 1874, p. 268, pl. 43, fig. 8, ♀ (*dry-season*). Doherty Journ. Asiatic Soc. Bengal, 1886, p. 123. de Nicéville, Butt. of India, etc., ii. p. 244 (1886).

Wet-season form (Plate 324, fig. 1, 1a, ♂, 1, b, c, ♀).

IMAGO.—Male. Upperside fulvescent-black; the bands uniformly fulvous. *Forewing* with a broad very irregularly sinuously-edged discoidal band, a broad subapical oblique sinuous band extending to the costa, and a broad lower-discal band, the latter being sinuous on its inner edge, curved on its outer edge, and joined by a narrow upper streak to the lower end of subapical band, above which latter is a slender apical lunule. *Hindwing* with an irregular-edged broad discal band and a rather broad submarginal band, the latter attenuated and curved upward to the upper median; followed by a slender interrupted marginal line to the apex. Underside yellowish-ochreous, blotched with darker ochreous. *Forewing* with the costal and medial tessellate marks broadly black; marginal black line prominent. *Hindwing* with the basal and lower discal tessellate marks broadly black; the submarginal conical spots large and speckled with metallic greyish-blue scales; the marginal lower lunules and lunule at abdominal angle also metallic greyish-blue.

Female. Upperside with the bands paler than in male. *Forewing* with the discoidal band less irregular edged, the subapical band broader and disconnected

from the lower band. *Hindwing* with the bands as in male. Underside as in the male.

Expanse, ♂ $2\frac{2}{10}$, ♂ $2\frac{3}{10}$ inches.

Dry-season brood (Plate 324, fig. 1, d, e, ♂, 1, f, g, ♀).

Male. Smaller than in wet-season form. Upperside with all the bands as in wet-season form, but somewhat paler. Underside paler yellowish-ochreous; tessellate marks the same but somewhat smaller; the submarginal series of spots smaller and not conical, each being formed by an upper and lower short black line, the lower second and third only being slightly speckled with metallic greyish-blue scales; marginal lower lunules and lunule at abdominal angle speckled with metallic greyish-blue scales.

Female. Upperside with slightly paler bands than in male; all the bands similar. *Forewing* with the subapical band broader, its lower inner angle touching the discoidal; lower-discal band partly joined by a streak to the lower ends of both the discoidal and subapical band. Underside as in the male.

Expanse, ♂ $1\frac{8}{10}$, ♀ 2 inches.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—We possess the type specimen, a dry-season male, taken in Kaschmir by the late Capt. R. Bayne Reed. A female from Kulu is in Col. C. Swinhoe's collection, and a female, also from Kulu, in Mr. P. Crowley's collection. A male, taken at Kaleni, at 3900 feet elevation, in May, by Capt. McArthur, is in Mr. J. H. Leech's collection. Mr. W. Doherty obtained it in the "Pindari Valley, 5000 to 8000 feet elevation, N.W. Kumaon" (J. A. S. Bengal, 1886, 123).

SYMBRENTHIA NIPHANDA.

Wet-season form (Plate 325, fig. 1, 1a, ♂, 1, b, c, ♀).

Symbrenthia Niphanda, Moore, Proc. Zool. Soc. 1872, p. 559. de Nicéville, Butt. of India, etc., ii. p. 243 (1886).

IMAGO.—Male. Upperside fulvescent-black; cilia alternated with white. *Forewing* with a yellowish-ochreous rather narrow band extending along lower half of the cell, including the median vein, and ending between the base of upper and middle median veinlets, its end being distinctly truncate, the upper edge irregularly waved, its lower edge even; a subapical outwardly-oblique narrow irregular band extending to the costa, a small apical lunule, and a lower-discal inwardly-oblique narrow somewhat recurved band. *Hindwing* with a broader discal band narrowing to the costa, below which is a submarginal somewhat lunular band attenuating

anteriorly to the upper subcostal veinlet, followed by a slender interrupted marginal line. Underside bright ochreous-yellow, with two marginal prominent slender black lines. *Forewing* also with broad black tessellated marks from base of costa to the apex and obliquely from below base of cell to middle of outer margin, the interspaces representing the areas of the bands of the upperside being glossy bluish-white and distinctly defined. *Hindwing* also with the basal and lower discal area tessellated with broad black marks, the intervening discal area being glossy opalescent-white; a submarginal series of five metallic-green conical spots, the two upper smallest and somewhat flattened, each spot black-speckled and outlined with black, and all encompassed by an outer slender black line; beyond is a marginal anterior black line, and posterior metallic-green lunules ending in a partially disconnected anal broader black lunule centred with blue-speckles; a small blue-speckled lunule also at abdominal angle; the linear interspace between the second row of basal black marks, and also between those above the abdominal angle being white. *Body* and palpi above fulvescent-black; abdomen with ochreous bands; body beneath and legs ochreous-yellow, abdomen with black spots; antennæ black, tip ochreous.

Female. Upperside with similar but slightly broader, and paler bands than in male. Underside as in male; all the markings somewhat broader, the marginal lower metallic-speckled lunules on the hindwing also much broader.

Expanse, ♂ $1\frac{8}{10}$ to 2, ♀ $2\frac{4}{10}$ inches.

Dry-season form (Plate 325, fig. 1d, e, ♂).

Male. Somewhat smaller than wet-season form. Upperside with all the bands similar, but of a paler yellowish-ochreous, their middle areas palest and their edges somewhat more irregular. Underside paler yellow than the wet-season form. Both wings with the tessellate black marks smaller, the white bands representing those of the upperside not glossy. *Hindwing* with the series of metallic-green spots smaller, shorter, and somewhat quadrate in shape, the disconnected anal lunule and the lunule at abdominal angle centred with blue speckles.

Female. Upperside with the bands slightly broader than in male. Underside as male.

Expanse, ♂ $1\frac{8}{10}$ to 2, ♀ 2 inches.

HABITAT.—Sikkim.

DISTRIBUTION.—“This is rare in Sikkim, occurring at low elevations from about 3000 to 5000 feet, from March to October” (H. J. Elwes, Tr. Ent. Soc. 1888, 365).

SYMBRENTHIA SILANA.

Wet-season form (Plate 325, fig. 2, 2a, ♂).

Symbrenthia Silana, de Nicéville, Journ. Asiatic Soc. Bengal, 1885, p. 117, pl. 2, fig. 9; Butt. of India, etc., ii. p. 243 (1886).

IMAGO.—Male. Upperside fulvescent-black. *Forewing* with a yellowish-ochreous discoidal band, which is palest in the middle, and somewhat irregularly-clavate in shape; a subapical rather broad angulated oblique band not quite reaching to the costa, and above which is a slender curved apical lunule; below is a broad lower-discal oblique band. *Hindwing* with a broad yellowish-ochreous discal band, palest in its middle, and not quite reaching the costa; a submarginal narrow band attenuating anteriorly and ending at the lower subcostal veinlet; a marginal obsolescent fine line. Underside bright ochreous-yellow. *Forewing* with very broad black tessellate marks, as normally disposed, except that the ordinary basal mark below the cell is absent, there being only three marks in the submedian interspace, and the two superposed subapical marks are distinctly ocellate, each having a white central dot; the marginal inner line is also thick, and the mark at posterior angle is large and prominent; the intervening areas representing the bands of the upperside are opalescent-white. *Hindwing* with broad black basal and lower-discal tessellate marks, the intervening discal area being opalescent-white, the outer-discal series of five spots are small, the middle one only being conical, the others almost round, and the three lower only are centred with metallic-blue scales; the three lower outer marginal connected-lunules are sharply angled and also centred with metallic-blue scales.

Female. "Larger. *Forewing* broader, the outer margin evenly curved; markings throughout paler; except the blue ones on the underside of hindwings, which are larger and more prominent. The subapical streak on the upperside of the forewing touching the costa, and a small narrow spot just within it."

Expanse, ♂ 2, ♀ $2\frac{2}{10}$ inches.

Dry-season form (Plate 325, fig. 2, b, ♂).

Male. Upperside with broader and paler bands, with more irregular edges. Underside paler yellow than in wet-season form, the areas representing the bands of upperside broader; markings the same, but not quite so broad; the submarginal black spot between the upper medians centred with blue speckles.

Expanse, ♂ $1\frac{8}{10}$ inch.

HABITAT.—Sikkim; Bhotan.

DISTRIBUTION.—"This is rare and local in Sikkim, at about 2000 feet elevation, VOL. IV, September 12th, 1899.

where Mr. Otto Möller has hitherto only procured it in May. It has also been taken at Buxa, Bhotan" (H. J. Elwes, Tr. Ent. Soc. 1888, 365). "All the specimens I have seen have been obtained in Sikkim at low elevations in March and May" (de Nicéville, *l.c.* 243).

MALAYAN SPECIES.—*Symbrenthia Hippoclus* (Pap. Hippoclus, Cramer, Pap. Exot. iii. p. 46, pl. 220, fig. C, D, ♂ (1779). Staudinger, Exot. Schmett. pl. 36, ♂. *Habitat.* Amboina.—*Symbrenthia Javanus* (Sym. Hippoclus, *var.* Javanus, Staudinger (Fruhstorfer, Berl. Ent. Zeit. 1896, p. 314); Sym. Hippoclus, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1891, pl. F, fig. 10, *dimorphic* ♀. *Hypanartia Hippocla*, Hübner, Samml. Exot. Schmett. iii. fig. 1, 2, 3, 4, ♂, *dimorphic* ♀ (1827). *Habitat.* Java.—*Symbrenthia Violetta*, Hagen, Deuts. Ent. Zeit. Lep. 1896, p. 165. *Habitat.* Sumatra; Borneo.—*Symbrenthia Niasica*. Male. Differs from *Violetta* on the underside in the ground-colour being duller ochreous-yellow and all the red markings very inconspicuous. On the *forewing* the small round spot between the upper and middle median is centred with ochreous-yellow and has a distinct blackish outer attached mark, the lower-discal oblique fascia is also inwardly-edged with yellow, in the Sumatran *Violetta* both these parts are distinctly violet. On the *hindwing* the obsolescent conical spots are also entirely yellow, and are not speckled with violet scales, the marginal lunular line is distinctly inwardly-bordered with blackish lunules from the anal angle to the apex, the lunule above outer angle being blue speckled. Female. Upperside with the bands similar but narrower than in *Violetta*. Underside paler than in male, the ground-colour and markings similar to *Violetta*, except that on the hindwing the marginal lunular line has a more or less defined inwardly-bordered shade. *Habitat.* Nias (Coll. Swinhoe and British Museum).—*Symbrenthia Semperi* (Sym. Lucina, Semper, Reisen Phil. Lep. p. 114, pl. 21, fig. 7, 8, ♂ ♀. *Habitat.* Philippines.—*Symbrenthia Anna*, Semper, *l.c.* p. 114, pl. 21, fig. 5, 6, ♂ ♀ (1888). *Habitat.* Bohol, Philippines.—*Symbrenthia Hypatia* (Laogona Hypatia, Wallace, Trans. Ent. Soc. 1869, p. 345, ♂). Hagen, Deuts. Ent. Zeit. 1896, p. 165. Distant, Rhop. Malay. p. 432, pl. 42, fig. 6, ♂. Fruhstorfer, Stett. Ent. Zeit. 1894, p. 125, pl. 3, fig. 4, ♂. de Nicéville, J. As. Soc. Bengal, 1895, p. 428. *Syn.* Symb. Chersonesia, Fruhst. Berl. Ent. Zeit. 1893, p. 38. Symb. Hippocrene, Staudinger, D. Ent. Zeit. 1896, p. 232, pl. 5, fig. 3, ♂. We have compared Wallace's type specimen, now in the Oxford University Museum, with male Sumatran and Bornean examples. A Sumatran female, in Mr. Godman's collection, has all the bands on the upperside broader and paler fulvous than in male; the ground-colour on the underside is slightly paler, but with all the dark reticulated markings the same as in male, except that on the forewing the two transverse discal slender lines between the lower median and submedian are joined together longitudinally in their middle and form a distinct yellow letter X. *Habitat.*

Java; Sumatra; Borneo; Malay Peninsula.—*Symbrenthia dissoluta*, Staudinger, Iris, 1889, p. 49. *Habitat.* Palawan.—*Symbrenthia Ottilia*, Fruhst. Berl. Ent. Zeit. 1897, p. 327. *Syn.* Sym. Hypselis, Weymer, Stett. Ent. Zeit. 1885, p. 264. *Habitat.* Nias, ? Sumatra.—*Symbrenthia Hypselis* (Vanessa Hypselis, Godart, Enc. Méth. ix. Suppl. p. 818 (1823). Laog. Hypselis, Boisd. Spéc. Gén. Lep. i. pl. x. fig. 3, ♂ (1836). Sym. Hypselis, de Nicéville, Journ. Bombay N. H. S. 1891, p. 356, pl. F, fig. 8, ♂. *Habitat.* Java.—*Symbrenthia Sinica*. Male. Upperside with the fulvous bands similar to those in Sikkim wet-season form of *Cotanda*, except that on the forewing the subapical band is longer, narrower, and its lower part longer. Underside with broader and more compactly-disposed black tessellate markings than in *Cotanda*, the metallic-blue conical spots on hindwing only about half their size, and the three marginal lower blue lunules very narrow. Female. Upperside with somewhat paler bands than in male, all wider. Underside as in the male. Expanse, ♂ 2, ♀ $2\frac{4}{10}$ inches. *Habitat.* W. China (Coll. Leech).

Genus PROTHOË.

Prothoë, Hübner, Samml. Exot. Schmett. ii. fig. 54 (1823-26). Doubleday and Westwood, Gen. D. Lep. ii. p. 266 (1850). Wallace, Trans. Ent. Soc. 1869, p. 80. Distant, Rhop. Malay. p. 110 (1883). Semper, Reisen Phil. Lep. p. 77 (1886). de Nicéville, Butt. of India, etc., ii. p. 293 (1886). Staudinger and Schätz, Exot. Schmett. ii. p. 177 (1888).

IMAGO.—Male. Wings large. *Forewing* triangular; costa slightly arched, apex obtuse; exterior margin slightly oblique, nearly straight and also even, posterior angle rounded; posterior margin almost straight; costal vein strong, extending to half the margin; cell extending to two-fifths at its upper end from the base; first subcostal branch emitted at one-fourth before end of cell and curved upward towards end of the costal vein, but entirely free from it; second subcostal branch at halfway between it and end of cell; third subcostal at one-sixth beyond the cell and extending to the apex; fourth and fifth branch at two-sixths beyond the cell, the fourth branch deflexed before reaching the end below the apex; upper discocellular extremely short, almost obsolete; middle discocellular oblique, rather short and slightly convex; the lower discocellular long, its upper end deeply concave, the lower end extending obliquely outward; middle median veinlet at one-sixth before lower end of cell, lower median at one-half before the end; submedian vein nearly straight. *Hindwing* somewhat triangularly oval; anterior margin long, gently curved from near the base, apex oblique; exterior margin convexly-oblique from end of upper subcostal, slightly waved, produced between the upper and middle median into a short broad outwardly-curved tail, from thence to anal angle broadly scalloped; a prominent tuft of long fine silky hairs extending hindward from basal interspace between the submedian

and inner vein, the tuft *overlapping a glandular patch of scales*; precostal vein slightly curved; subcostal ending below the apex, radial emitted from subcostal branch at some distance from the latter; cell open; lower median emitted opposite base of discocellular, upper and middle medians at some considerable distance beyond; submedian and inner vein much recurved from the base. *Body* moderately stout; palpi rather short, projected forward to level of vertex, compressed laterally, clothed with short appressed hair-scales, end of second joint above more hairy, apical joint conical; forelegs of male very short, thickly clothed to the tip with short hairs; forelegs of female laxly scaly, tarsus dilated towards the extremity and slightly truncate at tip, the spines slender and sharp-pointed; antennæ slender, with an elongated slender gradually-formed club; eyes naked.

TYPE.—*P. Franckii*.

PROTHOË ANGELICA (Plate 326, fig. 1, 1a, b, c, ♂ ♀).

Prothoë Angelica, Butler, Annals of Nat. Hist. 1885, pp. 53, 54. de Nicéville, Butt. of India, etc., ii. p. 295, front plate, fig. 120, ♂ (1886).

Prothoë uniformis, Butler, l.c. pp. 53, 54 (1885).

Prothoë Franckii (part), Wallace, Trans. Ent. Soc. 1869, p. 80. Moore, P. Z. S. 1878, p. 832. Elwes, P. Z. S. 1891, p. 284.

IMAGO.—Male. Upperside. Both wings dark blue-black, the basal area palest and thickly irrorated with light blue scales. *Forewing* with a narrow black slightly angulated streak crossing end of the cell but not quite touching the median vein; a broad discal outwardly-oblique pale blue band (of a lilacine or cobalt tint in certain lights) extending from the costa to the posterior angle, and traversed through its middle area by two more or less indistinctly-defined white costal streaks and a row of five lower obliquely-dentiform decreasing irrorated white streaks, one in each interspace from lower subcostal to lower median, the blue band being variable in width, in the male from four-tenths to five-tenths of an inch, and it generally includes the black cell-streak; the inner edge of the band is, generally, regular and speckled, its outer edge being more defined and irregular; beyond is an apical series of five superposed rounded lilacine-white spots, of which the lower first and third are very small and generally indistinct or obsolete. *Hindwing* with two elongated lilacine-white spots at the extreme apical margin divided by the upper submarginal veinlet; a slender lilacine-white interrupted wavy marginal line extending from anal angle to near the outer caudal angle; the glandular tuft of hairs reddish-ochreous. Underside pale olivescence-buff or brownish-ochreous, with dark brown markings. *Forewing* with a broad dark brown posterior marginal area, a narrow outer marginal middle line, a looped-spot at base of the cell, two superposed annular spots in the middle and a W-shaped mark near its end continued to the costa, the discocellulars

enclosed by a double line, some bordering spots outside the cell, a large broad upper discal patch decreasing from the costa sinuously to near the upper median and traversed by a pale sinuous streak, two outer-discal large somewhat hastate marks between the radial and middle median, the lower one being generally broken, an upper submarginal series of small slender sinuous marks, the upper two being double and with white centre, the two lower with a white outer streak, a small similar sinuous mark also between the middle and lower median; the outer margin inwardly blotched with reddish-ochreous; obliquely across the disc the interspaces between the veins are somewhat whitish, indicating the white marks of the band on the upperside. *Hindwing* with a dark brown spot at the base of costal lobe, a streak from base of abdominal margin extending across base of cell to the costa, some streaks below the cell to abdominal margin a reniform mark in middle of the cell, another at its end extending to the upper subcostal veinlet, and a slender angled-streak beyond the cell, a small patch above the cell, some streaks below the cell, two broad partly-coalescent irregular upper-discal patches descending from the costa, followed by an outer-discal series of large conical-shaped spots—one between each of the interspaces—and each thickly irrorated with black and metallic-greyish-green scales, the anterior inwardly margined by a black and an ochreous-red outer line, the lower with a black line only, each also is outwardly bordered by a blackish line; the middle of outer margin including the upper half of the tail is dark brown, the lower half of the tail being green or greyish-green inwardly and whitish outwardly; anal lobe with a black angled-mark centred with red outwardly and bordered by green or greyish-green inwardly; a smaller similar streak also above anal angle.

Female. Upperside as in male, except that the blue band on the forewing is somewhat broader and its white markings also broader and longer. On the hindwing the apical white spots are also somewhat broader, and the lower marginal white line more prominent. Underside also as in male, except that on the forewing the interspaces between the veins obliquely across the disc—indicating the white portions of the band of the upperside—are broader and more defined. *Body* above blue-black, beneath whitish with blackish stripes; palpi above brown, sides white and with a black stripe beneath; legs blackish above, whitish beneath; antennæ reddish-ochreous.

Expanse, ♂ 3 to $3\frac{2}{10}$, ♀ 3 to $3\frac{6}{10}$ inches.

HABITAT.—Upper Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION AND HABITS.—The type specimens are recorded by Mr. Butler from “Tenasserim, Borneo, and Sumatra” (*l.c.* p. 54). Mr. Otto Limborg took it at “Meetan, Upper Tenasserim, in April” (P. Z. S. 1878, 832). In Mr. F. D. Godman’s collection are specimens from Malawoon, Burma, taken by Mr. A. O. Hume, both sexes from E. Pegu, taken in March and September by Mr. W. Doherty;

also from Borneo. It is recorded from "Sandakan, N. Borneo" (Pryer and Cator, N. Borneo Herald, 1894, 258). Mr. H. Grose-Smith has a female from Daat Island, Labuan, and Mr. P. Crowley has both sexes from Perak, and Lawas, N. Borneo. Mr. W. Doherty records it as "occurring not uncommonly at the foot of the Karen Hills, E. Pegu, and was taken on the body of a dead Python. It is very fragrant in both sexes" (P. Z. S. 1891, 256). Mr. T. A. Hauxwell obtained it at Tounghou, Upper Tenasserim, and notes that it "flies low, and settles low down on the trunks of trees, with closed wings, only two or three feet from the ground. Once frightened it never returns to the same spot" (L. de Nicéville, J. Bombay N. H., 1899). It is "found not rarely in Sumatra. It settles on tree trunks with its head downwards" (*id.* J. A. S. Bengal, 1895, 439).

Our illustrations on Plate 326 are from a male and female taken in E. Pegu,

PROTHOË REGALIS (Plate 326, fig. 2, 2a, ♂).

Prothoë regalis, Butler, Annals of Nat. Hist. 1885, pp. 53, 54, 306, pl. 8, fig. 1, ♂. de Nicéville, Butt. of India, etc., ii. p. 296 (1886). Doherty, Journ. Asiat. Soc. Bengal, 1889, p. 126.

IMAGO.—Male. Upperside. "Both wings with the basal third and body olive-green. *Forewing* crossed obliquely from middle of the costa to the third-fourth of the inner margin by a broad silvery-blue belt, the external edge of which is irregularly notched and only separated by a blackish submarginal streak from three large spots of the same colour upon the centre of the external border; veins slenderly black, terminating in blackish spots, two of which are placed between the above-mentioned blue spots; two white spots followed by a blackish streak upon the costal part of the blue belt; a large triangular black spot closing the cell; apical area chocolate-brown; three subapical spots, the two upper large, placed obliquely, bluish, with white centres, the submarginal bluish, small. *Hindwing* with the centre of the wing blue-black; apical area and external border chocolate-brown; two linear apical blue dashes and a blue line along base of the fringe. Underside. *Forewing* whitey-brown, slightly tinted with greenish towards the base and with lilacine along the external border; markings very similar to those in *P. Franckii*, but the outline spots on the discoidal area filled in with dark olivaceous, with no trace of an oblique white band and with all the internervular submarginal markings cruciform. *Hindwing* with the basal half as in *P. Franckii*, excepting that the discoidal spots are filled in with dark olivaceous; external half considerably darker, its inner half greyish-olivaceous, enclosing a series of oblong internervular black patches, which are sinuated in front and bounded by reddish crescentic borders; immediately beyond these reddish crescents is a submarginal series of eight unequal

black-edged bronze-green spots, with brighter green borders; these spots are irrorated and more or less suffused with blackish; from apex to second median branch is a series of gradually increasing marginal black spots, edged externally with pink, the last two crossed by a red stripe; a large bright olive-green semi-circular spot, with black inner border and bluish-white outer border at outer extremity of first median interspace, and a large black spot, crossed by a red Λ -shaped marking, and bordered along its infero-exterior border with grey, at the extremity of interno-median area; a triangular black and red spot at extremity of abdominal fold" (Butler, *l.c.* 306).

Expanse, ♂ $3\frac{2}{10}$ inches.

HABITAT.—Manipur; Upper Assam.

NOTE.—“Duller in colour than *P. Angelica*; differs in the absence of white on the blue belt, and in the great width of the belt, and in the presence of blue marginal spots on the forewing, the less caudate hindwing, the cruciform character of the black submarginal markings of the underside of the forewing, the filled-in discoidal markings on both wings, the inner-half of external area of hindwing, on the underside, being greyish-olivaceous crossed by oblong black patches with reddish external borders, the shorter green and black submarginal arched spots, etc.” (Butler, *l.c.* 54).

DISTRIBUTION.—A single specimen of the male of this species was taken in Manipur by Dr. G. Watt. Mr. W. Doherty “obtained one male near Margherita, and one was seen near Sadiya, Upper Assam, the former agreeing with *regalis* in the dusky underside, and the very broad blue band and five blue spots of the forewing above, but the hindwing and the base of the forewing have an obvious violet-gloss, though they are not, as in *angelica*, powdered with the bluish-white scales” (*l.c.* 126).

INDO-MALAYAN SPECIES.—*Prothoë Niasica*, Röber, Entom. Nachr. 1894, p. 366. *Habitat.* Nias Island.—*Prothoë Franckii* (Nym. Francki, Godart, Enc. Meth. ix. Suppl. p. 825 (1823). Hübner, Samml. Exot. Schmett. ii. pl. 54 (1823–26). Doubleday and Westwood, Gen. D. Lep. ii. p. 266, pl. 51, fig. 3, ♀ (1850). Wallace, Tr. Ent. Soc. 1869, p. 80. Butler, Ann. Nat. Hist. 1885, p. 52. *Habitat.* Java.—*Prothoë Semperi*, Honrath, Berl. Ent. Zeit. 1884, p. 204, pl. 2, fig. 1, 1a. Semper, Reisen Phil. Lep. p. 77, pl. 15, fig. 1 (1887). *Habitat.* Mindanao.—*Prothoë Plateni*, Staudinger (Semper, Reisen Phil. Lep. p. 334). *Habitat.* Mindoro.

Genus AGATASA.

Male. More robust than in typical *Prothoë*. Forewing with the base of costal and subcostal vein curved inward, the subcostal being perfectly free from end of

costal vein; middle discocellular slightly concave, lower discocellular oblique and very slightly but evenly concave; basal interspace between the submedian and posterior margin thickly clothed with fine longish appressed woolly-hairs. *Hindwing* somewhat narrower than in *Prothoë*, the anterior margin very much arched from the base and thence oblique to apex; upper area of the cell longer, the radial starting from second subcostal at nearly equal distance as the latter does from the costal; submedian vein densely covered from its base to end with fine long laterally-spreading woolly-hairs; the basal area of the cell and of middle and lower medians also clothed with fine longish woolly-hairs. *Body* very robust; base of abdomen densely woolly; palpi longer, and curved upward.

TYPE.—*A. Calydonia*.

HABITS.—Mr. L. de Nicéville records *A. Calydonia* as being found, in Sumatra, only in forest, and is rare. Dr. L. Martin took his first specimen on a wounded tree, where it was sucking up the juice. It was on the fourth day, after having missed it the three previous days, and on the very same tree. Only one pair of this strong-winged butterfly may be found over a large area of forest, which likes to keep to the higher trees, quite out of the reach of the net, but is fond of fæces and strong-smelling things, such as carrion, to which it is often attracted and caught. It settles with the head downwards on tree trunks, and makes, while feeding, the same rotating movements in the hindwings as is done by many *Lycænidae*" (J. As. Soc. Beng. 1895, 438).

AGATASA BELISAMA (Plate 327, fig. 1, 1a, ♂).

Prothoë Belisama, Crowley, Trans. Ent. Soc. Lond. 1891, p. 403, pl. 18, fig. 1, 2, ♂.

Male. Upperside. *Forewing* with the medial, basal, and lower-discal area deep sulphur-yellow, the lower base bluish-white, the apical half from base of the costa across upper end of cell and then irregularly-angled across the disc to posterior margin before the outer angle, brownish-black; a small yellow narrow costal spot above end of the cell, an outwardly-oblique subapical series of four irregular-shaped spots, the first from the costa small, the next also small and placed between the lower subcostals, the third and fourth in the next interspaces, both being elongated; at the apex is a small obsolescent brownish-white spot. *Hindwing* with the base and lower-discal area bluish-white, the broad woolly covering of the submedian being slightly tinged with sulphur-yellow, the upper medial-discal interspaces between the subcostal and radial being also tinged with very pale sulphur-green, and the outer costal border above white; outer margin with a broad irregular bluish-black band, the extreme marginal edge having a slender interrupted white line. Underside. *Forewing*. Ground-colour white, with the medial-discal area from the

cell to outer margin bright yellow, the apical area clouded with very pale ochreous-brown; marked with three black spots along base of the costa, a spot at base of cell, two rounded spots across its middle, an elongated constricted spot beyond from the costa, and a streak close to end of cell; beyond is an irregular streak decreasing from the costa to the upper median veinlet, followed by some upper-discal irregular-shaped streaks and a lower loop-mark between the upper medians, and then by three outer transverse series of various narrow-shaped marks, the lowest of each series being disposed between the upper medians, the extreme outer-margin bordered by a slender black band, and above the posterior angle is an irregular, broken, diffused black patch; the intervening spaces between the cell markings and partly between those of the upper disc and of the outer margin, being bright ochreous-red. *Hind-wing.* Ground-colour white. Basal interspaces to the middle of the costa with partly confluent black streaks intervened with ochreous-red; a series of elongated black streaks disposed across the disc from middle of abdominal margin to near the anterior margin before the apex, the streaks being placed singly between the veins, except in the discoidal interspace, where it is in three portions, the intervening veins and their borders being lined with ochreous-brown, brightest between the discoidal portions and at outer end of the upper streaks; beyond are two pairs of submarginal prominent black lunular lines, each pair being traversed by a similar bluish-white line, the inner pair being also somewhat sinuous at the anterior end, and the interspace between the pairs is irrorated with pale green and black scales; outside the end of the outer pair is a row of three similar black-and-white lunules extending from anal angle to the caudal angle, the caudal portion being broadly black, each of these and those above the tail are outwardly bordered by bright yellow, and the outer black lunule at anal angle is broken by a small bright ochreous-red bar; intervening between the discal black streaks and the inner submarginal line is a parallel row of diffused black lunules. *Body* above white; base of thorax and of abdomen very woolly; collar with two black bands; head black and white spotted; palpi above and beneath black, its sides white; legs whitish above, blackish beneath; antennæ blackish above, red beneath.

Expanse, ♂ $4\frac{2}{10}$ inches.

HABITAT.—Lower Burma.

DISTRIBUTION AND HABITS.—The type specimen was taken in Tounghoo, and is in the collection of Mr. P. Crowley. Mr. W. Doherty obtained "three specimens at Petichaung, at the foot of the Karen Hills, E. Pegu" (P. Z. S. 1891, 284). Mr. T. A. Hauxwell states that "it occurs rarely in the Ataran Valley in March, and in the Tounghoo Hills, 3000 feet elevation, in April and June." As stated by Mr. A. R. Wallace, in "the Malay Archipelago, with regard to the very closely-allied *Prothoë Calydonia*, this species flies high and settles high up on tree trunks with closed

wings, very rarely descending to the ground. It invariably returns to the same spot when frightened off, so if its resting-place is within reach, the butterfly, with patience, can be secured with certainty. To capture one specimen my men and I had to construct three high platforms of bamboo adjoining three trees between which *P. Belisama* continually flew backwards and forwards. After some time we managed to secure the specimen" (L. de Nicéville, Journ. Bombay N. H. Soc. 1899).

INDO-MALAYAN SPECIES.—*Agatasa Calydonia* (Nymph. Calydonia, Hewitson, Exot. Butt. i. p. 86, pl. 43, fig. 3, 4 (1855). *Charaxes Calydonia*, Butler, P. Z. S. 1865, p. 638. *Prothoë Caledonia*, Butler, P. Z. S. 1867, p. 873. Distant, Rhop. Malay. p. 110, pl. 13, fig. 9, ♂ (1883). de Nicéville, Butt. India, etc., ii. p. 297 (1886); *id.* Journ. As. Soc. Beng. 1895, p. 438. *Habitat.* Malay Peninsula; Sumatra; Labuan, Borneo.—*Agatasa Chrysodonia* (*Prothoë Chrysodonia*, Staudinger, Deuts. Ent. Zeit. 1890-91, p. 86, pl. 4, fig. 6). *Habitat.* S.E. Mindanao.—*Agatasa Heterodonia*, Staudinger (Semper, Reisen Phil. Lep. p. 334). *Habitat.* Mindoro.

Genus RHINOPALPA.

Rhinopalpa, Felder, Wien. Ent. Monats. iv. p. 399 (1860); *id.* Neues Lep. p. 49 (1861). Distant, Rhop. Malay. p. 97 (1883). de Nicéville, Butt. of India, etc., ii. p. 245 (1886). Staudinger and Schätz, Exot. Schmett. p. 128 (1887).

Eurhinia, Felder, Reise Novara, Lep. iii. p. 405 (1867).

IMAGO.—Male. Wings short, broad. *Forewing* triangular; costa very much arched, slightly indented near the base, apex truncate and obliquely-angulated outward to below the upper radial, deeply concave below it, sinuous, and broadly angled outward at the lower median veinlet, posterior angle rounded, posterior margin much recurved; costal vein extending to middle of the margin; first and second subcostal branches emitted near together before end of the cell, third branch at three-fifths beyond the cell, fourth and fifth at one-fifth from the apex; upper discocellular short and outwardly-oblique, middle discocellular practically obsolete, as the lower radial starts from the same point, lower discocellular absent and the cell entirely open; two upper median branches from opposite the discocellular; submedian vein straight. *Hindwing* somewhat quadrate; anterior margin lobate at the base, and thence oblique to the apex, exterior margin sinuous, almost erect from the apex to end of radial, where it is prolonged into a blunt tail and from thence concave to anal angle, which latter is broadly produced, the abdominal margin being excavated above the anal angle and more deeply so between the submedian and internal vein; precostal vein strongly bent outwards; costal vein strongly arched from the base, running close to the margin and ending at the apex; radial from close to base of lower subcostal; cell open. *Body*

stout, abdomen short; palpi long, porrect, compactly clothed beneath and at the sides, apical joint pointed; forelegs of male clothed with rather short hairy-scales, femur with long hairs beneath; fore tarsi of female smoothly scaled, tip dilated beneath, joints crowded together at the tip, spines acute; antennæ with a lengthened well-formed club; eyes naked.

TYPE.—R. Fulva.

RHINOPALPA POLYNICE (Plate 327, fig. 2, 2a, b, ♂ ♀).

Papilio Polynice, Cramer, Pap. Exot. iii. pl. 195, fig. D, E, ♂ (1780).

Rhinopalpa Polynice, Kirby, Catal. D. Lep. p. 191 (1871). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 429.

Rhinopalpa fulva, Felder, Wien. Ent. Monats. iv. p. 399 (1860). Butler, Trans. Linn. Soc. Zool. 1877, p. 545. Distant, Rhop. Malay. p. 98, pl. 12, fig. 1, ♂, 2, ♀ (1883). de Nicéville, Butt.

of India, etc., ii. p. 246, pl. 23, fig. 102, ♂ (1886); Journ. As. Soc. Bengal, 1895, p. 429.

Rhinopalpa Birmana, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 331.

IMAGO.—Male. Upperside reddish-ochreous; cilia black, alternated with white. *Forewing* with a dark ochreous-brown, almost black, outer marginal band, which is broadest anteriorly and of slightly variable width, its inner edge being curved to the costa. *Hindwing* with a similar coloured outer marginal band, which is broadest anteriorly, narrowing to above the radial veinlet and traversed outwardly by two indistinct paler lunular lines, from whence it is continued to the anal angle as two, more or less slender, or partly conjoined lunular black lines, the outer line being generally the broadest, the anal end dilated and angled upward and speckled with violet scales; within the lower submarginal area is a parallel series of four round black-speckled, or entirely black, spots, the upper one being between the radial and subcostal and sometimes encompassed by the marginal band. Underside clear sepia-brown, or dark sepia-brown, crossed by a subbasal and an ante-medial darker brown or purpurescent-brown broad sinuous fascia, each edged on both their sides by a very slender violet-blue line, followed by two medial-discal slender dark brown sinuous fasciæ inwardly-edged by a slender violet-blue line; an outer-discal broad dark brown lunular fascia which is more or less slightly, or sometimes obsolescently, inwardly-bordered by reddish-ochreous lunules on both wings and less so outwardly on the forewing, but also more prominently outwardly on the hindwing, where, in the latter wing, the red lunules are sometimes broader and at anal angle dilated, the lower second and third lunules being sometimes absent; beyond them is a submarginal contiguous row of large rounded ocelli, each with a violet-blue and black central dot and black-and-violet edged outer ring; on the forewing there are six of these ocelli, the lowest being bipupilled and inwardly-bordered by a broad violet-

white straight streak, and above the upper ocellus is an apical sinuous white spot; on the hindwing there are only five ocelli, the apical being absent; beyond these ocelli are two outer submarginal slender violet-blue lines followed by a dark brown broader line; anal and caudal angle reddish-ochreous. Body reddish-ochreous; thorax olivescens-ochreous; palpi above brownish-ochreous, beneath white; legs dark brown; middle tarsi whitish above; antennæ blackish, reddish beneath, tip black.

Female. Upperside much paler ochreous, the base darker. *Forewing* with the blackish outer-marginal band broken towards posterior angle and slightly showing a bipupilled ocellus. *Hindwing* with the outer band not reaching the margin; lower submarginal spots smaller and with a slightly-indicated outer ring. Underside pale ochreous; the transverse sinuous fasciæ darker ochreous and with prominent violet-white edged-lines; outer series of ocelli prominent; marginal violet-white lines distinct.

Expanse, ♂ $2\frac{8}{10}$ to 3, ♀ 3 to $3\frac{2}{10}$ inches.

HABITAT.—Assam; Cachar; Khasia Hills; Naga Hills; Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—“Mr. J. Wood-Mason obtained it in the forests near Silcuri, Cachar, from May to August. There are specimens from Cherrapunji, Assam, and the Naga Hills, in the Calcutta Museum. Mr. J. L. Sherwill took it in the Jorehat district, Assam, in October, Mr. H. M. Parish obtained a female in November in the Chittagong Hill Tracts. Capt. C. T. Bingham took a male in the Donat Range, Upper Tenasserim, in December, which approaches the figure of Cramer's *Polynice*, in having the ground-colour of the upperside much darker than the other specimens I have seen, and the outer black border broad at the apex of the forewing, the underside is also much darker. A female, taken in October also in the Donat Range, is also much darker than the Chittagong female mentioned above. It does not appear to be a common species anywhere” (de Nicéville, *l.c.* 247). Col. C. Swinhoe has received it from the Khasia Hills. Mr. P. Crowley has specimens from the Naga Hills, Tounghoo, Upper Tenasserim. Col. C. H. E. Adamson says “it appears to be scarce in Burma; I took four males at Phapoon on the Yunzaleen River in November, and have it also from Tavoy” (List 1897, 25). Dr. J. Anderson took it at “Minthantoung and in Mergui in December” (J. Linn. Soc. Zool. 1886, 35). We have verified males from Malacca and Perak, and a Malacca female in the Hewitsonian collection. Mr. de Nicéville says, “in N.E. Sumatra it is found only in large forest, the males being fond of fæces on forest roads; the females being very rare and are seldom seen in collections, perhaps escaping capture by the coloration being very different from that of the males, as on the wing the female closely resembles a common *Cirrochroa*” (J. A. S. Beng. 1895, 429). It also occurs in Borneo.

INDO-MALAYAN SPECIES.—*Rhinopalpa Eudoxia* (Vanessa Eudoxia, Guérin, Rev. Zool. 1840, p. 44; Delessert's Voy. l'Inde, p. 73, pl. 20, ♀ (1843). Distant, Rhop. Malay. p. 99, pl. 17, fig. 6, ♀ (1883). de Nicéville, Butt. India, etc., ii. p. 248. *Syn.* *Rhinopalpa Callonice*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 330, ♂ ♀. *Habitat.* Nias Island.—*Rhinopalpa Elpinice* (Eurhinia Elpinice, Felder, Reise Nov. Lep. iii. p. 405 (1867). *Habitat.* Java.—*Rhinopalpa Stratonice* (Eur. Stratonice, Felder, Reise Nov. Lep. iii. p. 607 (1867). Semper, Reis. Phil. Lep. p. 121, pl. 20, fig. 10, ♂, pl. 21, fig. 9, 10, ♀. *Habitat.* Philippines.

Genus YOMA.

Yoma, Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 258. de Nicéville, Butt. of India, etc., ii. p. 245 (1886).

IMAGO.—Male. Wings similar in shape to *Rhinopalpa*, except that in the forewing the outer margin is less sinuous below the subapical angle, and is less produced at the lower median; third subcostal branch emitted at more than one-third beyond the cell, fourth and fifth branch half-way thence to the end; upper discocellular distinct, short, middle discocellular long, angled obliquely-inward, and bent outward near lower end, lower discocellular slender and slightly concave; two upper median branches from lower end of the cell. *Hindwing* with the outer margin almost even and convex anteriorly, the caudal angle shorter and at end of upper median instead of the radial vein, as in *Rhinopalpa*; the abdominal margin less excavated and with but one lobe at the anal angle; precostal vein slightly bifid; cell closed by a very incipient slender curved lower discocellular. Palpi more coarsely clothed with stouter scales; antennæ shorter, club also shorter.

TYPE.—Y. Vasuki.

LARVA.—[Sabina.] Head with two erect branched-spines; segments with dorsal and lateral rows of branched-spines.

PUPA.—Suspended. Moderate sized. Head-piece projected, pointed; thorax much arched hindward; abdomen slightly convex dorsally, and with a row of fine spines, and lateral small tubercular points.

YOMA VASUKI (Plate 328, fig. 1, 1a, b, c, ♂ ♀).

Yoma Vasuki, Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 259.

Rhinopalpa Vasuki, de Nicéville, Butt. of India, etc., ii. p. 247 (1886).

IMAGO.—Male and female. Upperside. Both wings deep vinous-brown, palest on the outer margins, which are traversed by two submarginal indistinct somewhat-lunulated black lines; the disc crossed by a broad bright deep yellowish-ochreous

band, its inner-edge being sharply-defined, and somewhat irregular on the forewing, its outer-edge blurred, and on the forewing directed somewhat inwardly from above the upper median, becoming gradually narrower towards the anal angle of hindwing, but to which it does not quite reach; cilia lilacine-grey tipped with black at end of veins. *Forewing* also with three superposed subapical outwardly-oblique pale ochreous spots, the upper one being slender, the next much larger, the lowest small and speckled; below these and near the discal band are two small white spots placed above and below the upper median; across middle of the cell are two indistinct black sinuous lines and another pair at its end enclosing the discocellulars. *Hindwing* with a small more or less obscurely-defined outer-discal black spot margined with pale ochreous, placed between the lower and middle medians; the outer border and anal angle grey-speckled. *Underside*. Both wings pale greyish-ochreous-brown, slightly flushed with vinaceous-grey, and irrorated with darker brown scales; the discal band, as above, being more or less grey and speckled with brown scales, its edges also more or less sharply-defined; the basal area crossed by two similar-coloured sinuous-edged fasciæ; the submarginal lunular lines very obscure. Both wings with an outer-discal row of obscurely-defined black dots placed between the veins, those on the hindwing being slightly surrounded by pale ochreous, and the two on the forewing, representing the pair of the upperside, are entirely white; posterior angle of forewing broadly lilacine-grey speckled, and with a quadrate black spot; anal angle of hindwing also grey-speckled. *Body* and palpi above brown, beneath and legs pale yellowish-ochreous; antennæ blackish above, beneath and tip ochreous.

Expanse, ♂ ♀, 3 to $3\frac{4}{10}$ inches.

HABITAT.—Burma; Tenasserim.

DISTRIBUTION.—“Mr. W. Doherty found it flying rather commonly in the open country at the foot of the Arakan Yoma near Sandoway, Arakan, and has the habits of *Hypolimnas Bolina*. In Major Marshall’s collection are several specimens from Rangoon. It occurs also in Tavoy.” (de Nicéville, l.c. 248). Col. C. H. E. Adamson records it as being “found throughout Burma in the dry-season. In February, 1892, it was very common at Aloungdau Kathapa Pagoda, in the Chindwin District. It frequents thick forest, and is very difficult to catch in good order” (List 1897, 25). Capt. E. Y. Watson says it “occurred commonly in the Upper Chindwin in April, but almost invariably in bad condition, and also very difficult to catch” (J. Bombay N. H. S. 1897, 656). Capt. Watson also took it at “Beeling in Upper Tenasserim” (*id.* 1888, 6), and on the road from “Pauk to Tilin in November, and at Tilin from December to May, was very common in March, but specimens, though fresh, were terribly battered” (*id.* 1891, 41). Mr. W. Doherty took “several specimens near Momeit, Upper Burma” (P. Z. S. 1891, 285). Dr. F.

Manders records having "several specimens taken in widely different localities. It is common in Eastern Karenee, also in the forest belt between Burma and the Shan States, and appears partial to thick jungle near water. I have taken it in July, and also in January" (Tr. Ent. Soc. 1890, 525). A single male is recorded from Sinbyoodine on the Siam frontier" (J. A. Soc. Beng. 1887, 422).

Genus APATURA.

Apatura, Fabricius, Illiger's Mag. vi. p. 280 (1807). Scudder, Proc. Boston Acad. Arts and Sci. x. p. 115 (1875). Moore, Lep. of Ceylon, i. p. 57 (1881). Doherty, Journ. As. Soc. Bengal, 1886, p. 109.

Hypolimnas, Hübner, Verz. bek. Schmett. p. 45 (1816); *id.* Samm. Exot. Schmett. ii. (1822-5). Distant, Rhop. Malay. p. 164 (1883). de Nicéville, Butt. of India, etc., ii. p. 121 (1868). Staudinger and Schätz, Exot. Schmett. ii. p. 131 (1887).

Esoptria, Hübner, Verz. bek. Schmett. p. 45 (1816).

Diadema, Boisduval, Voy. Astrolabe, Lep. p. 135 (1832); *id.* Ann. Mus. Hist. Nat. p. 187 (1833). Doubleday and Westwood, Gen. D. Lep. p. 279 (1850). Wallace, Trans. Ent. Soc. 1869, p. 27. Felder, Neues Lep. p. 25 (1861).

Æola (part), Billberg, Enum. Ins. p. 78 (1820).

IMAGO. Male. *Forewing* triangular; costa much arched, apex obtusely convex; exterior margin oblique, slightly angulated below the apex, concave below the middle, and slightly scalloped; posterior margin slightly recurved; costal vein extending to more than half the margin; first subcostal branch emitted at one-fifth before end of the cell, and second subcostal close to the end, third branch at one-third beyond, fourth and fifth at two-thirds beyond; cell broad, truncate at end, less than half length of wing; upper discocellular very short, outwardly oblique, middle discocellular curved inward, lower discocellular long, very slender and slightly curved outward; radials from their angles; middle median veinlet emitted at some distance before lower end of cell, lower median at half the length; submedian nearly straight. *Hindwing* broad, somewhat rounded; exterior margin very convex, scalloped; costal vein extending to the apex, much arched from the base; precostal vein short, incurved, emitted at some distance above base of subcostal; the subcostal branch emitted at one-fourth before upper end of cell; upper discocellular short, curved outward, lower discocellular long, curved outward and very slender; radial from their middle; two upper medians from lower end of cell, lower median from opposite subcostal branch; submedian slightly curved, internal vein deeply curved at the base. *Body* moderately stout, palpi porrect, second joint long, projecting half its length beyond the head, compactly squamose beneath, second joint slightly pilose at upper and inner end, third joint short,

pointed; forelegs of *male* slender, femur scaly above, hairy beneath, tibia and tarsus clothed with rather short fine hairs; forelegs of *female* long, very slender, scaly, femur with a few fine hairs beneath, tarsus spined at the tip; antennæ somewhat short, with a rather short well-formed cylindrical club; eyes naked.

LARVA.—Cylindrical. Head surmounted with two long erect branched-spines; segments armed with a dorsal and four, or five, lateral rows of branched-spines.

PUPA.—Stout. Abdomen arched, and with a dorsal and two lateral series of short, stout, sharp tubercular-points; thorax arched and obtusely angular; head-piece obtusely cleft.

TYPE.—A. Bolina.

MIMICRY.—Colonel C. Swinhoe, in his paper on "Mimicry in butterflies of the genus *Hypolimnas*" (Journ. Linn. Soc. Zool. 1895, p. 339) writes, "The *Bolina* group of the Nymphalid genus *Hypolimnas* contains, according to systematists, a number of species. When, however, we look at the group from a biological point of view, we find that all these species can be merged in two distinct species—*H. Misippus*, Linn., and *H. Bolina*, Linn. It is first of all necessary to gain a conception of the appearance presented by these species before the mimetic form was assumed. This we find to be still retained by the male of *H. Misippus*, which is invariably non-mimetic, and that of *H. Bolina*, which is non-mimetic in India, and in certain other localities. Occasionally the females also revert to the ancestral pattern, and resemble the black males. The non-mimetic males are very similar in appearance, while their mimetic females differ widely. The female of *H. Misippus*, however, except as a very rare variety which resembles the male in appearance, always mimics the commonest of all the *Danainæ*, i.e. *Danaïs Chrysippus*, Linn., which is common all over India, Burma, Ceylon, the Malay Archipelago, Madagascar, Aden, the West, South, and South-eastern coasts of Africa, but apparently not the interior; in all these localities *H. Misippus* also exists, the female being of the *Danaïs* colour and pattern, and where *D. Chrysippus* does not exist, *H. Misippus* is not to be found." "In Africa and at Aden there are several forms of *Danaïs Chrysippus*—some without the white-banded black apical patch to the forewings (*Danaïs Dorippus*, Klug); some possessing this marking, but characterized by white hindwings (*Danaïs Alcippus*, Cram.), and also others with the *D. Dorippus* pattern and white hindwings. All these forms are mimicked in their several localities by the females of *Hyp. Misippus*." "In India the form of female *Hypolimnas* which mimics *Danaïs Dorippus** (without the black and white apical patch) is also found; it is not nearly so frequently met with as the mimic of the true *Danaïs Chrysippus*,†

* *Klugii*, Butler—See Lep. Ind. vol. i. plate 9, figs. 1, 1a.

† See Lep. Ind. i. plate 8, figs. 1a—e.



1.



1^b



1^a



1^c



2^a



1^d



1^e



2



2^b



1.



1^b



1^a



1^c



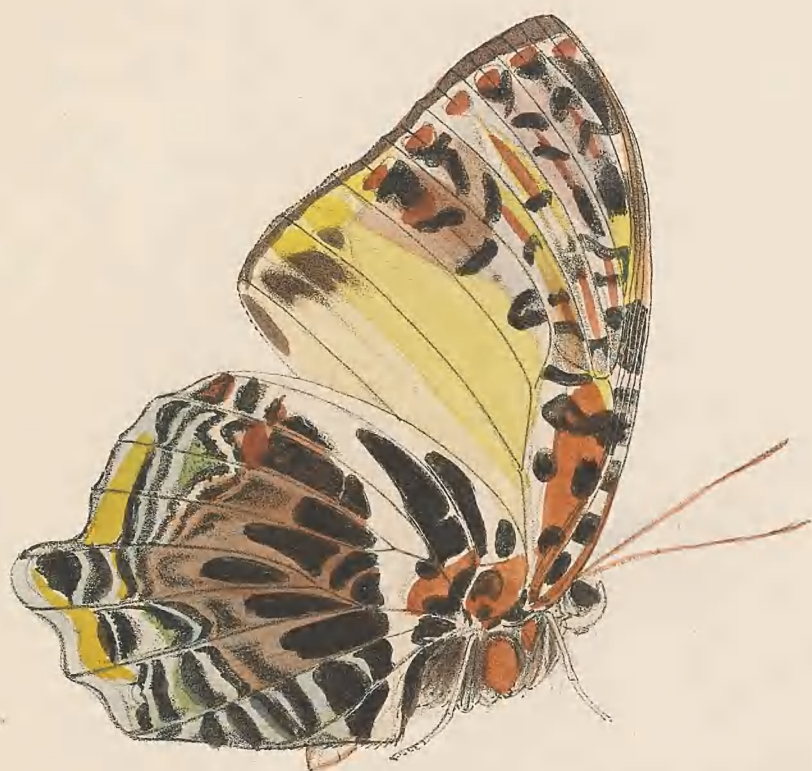
2



2^a



1.



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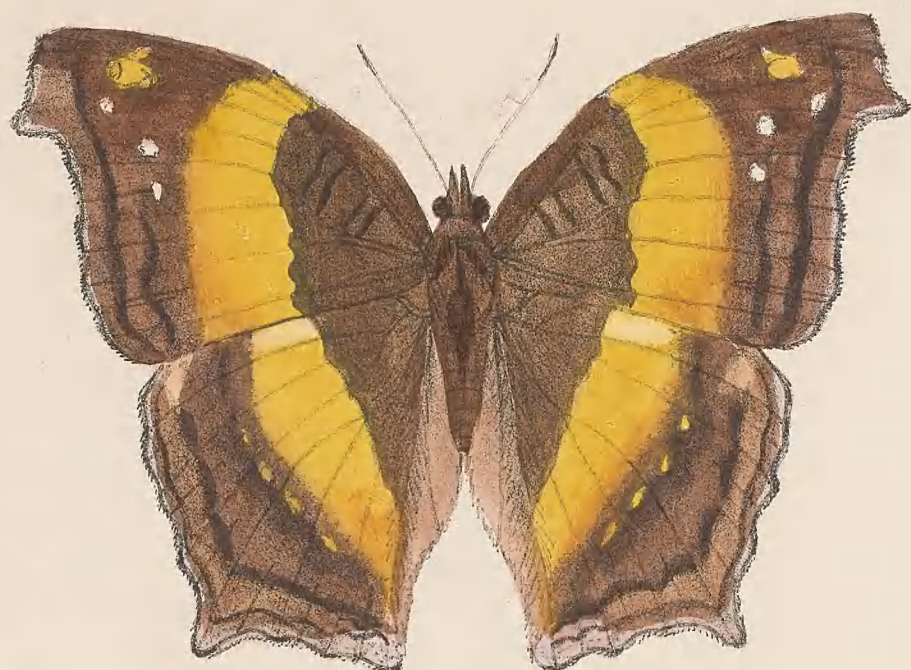
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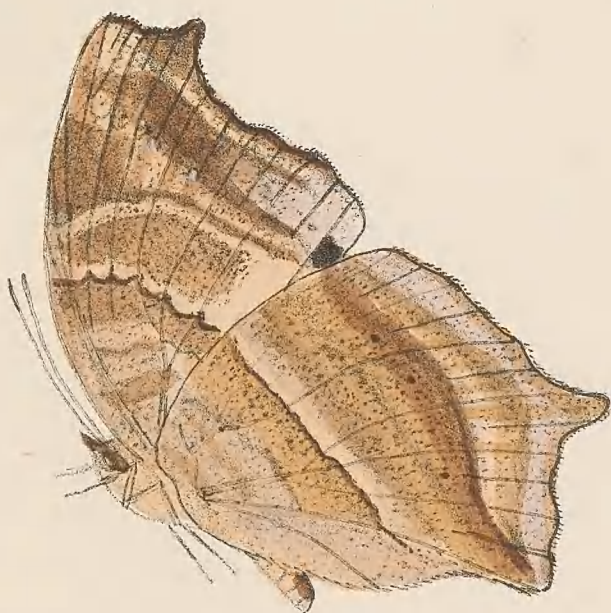
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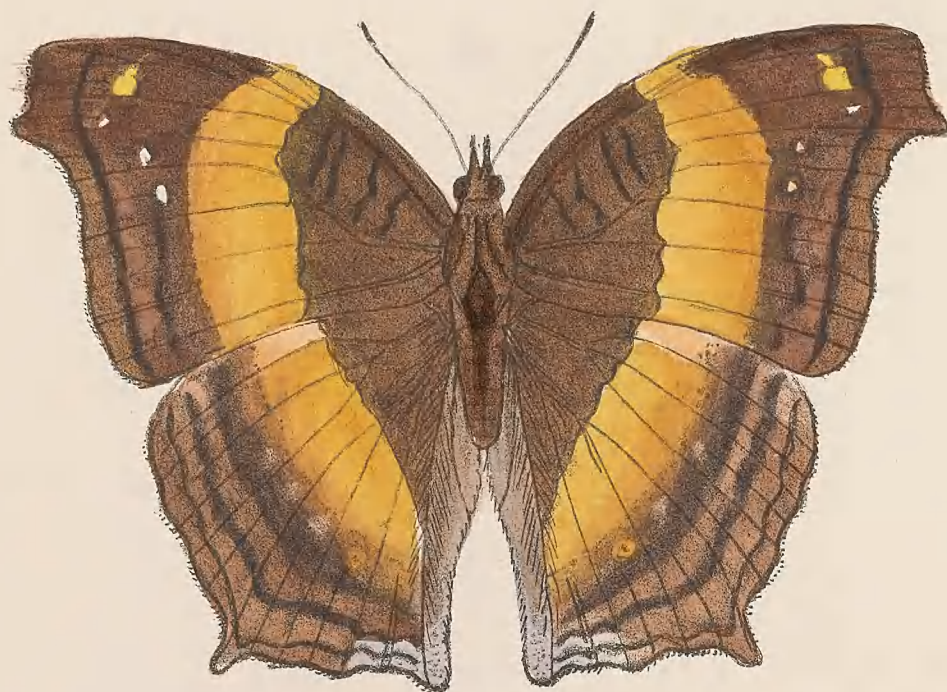
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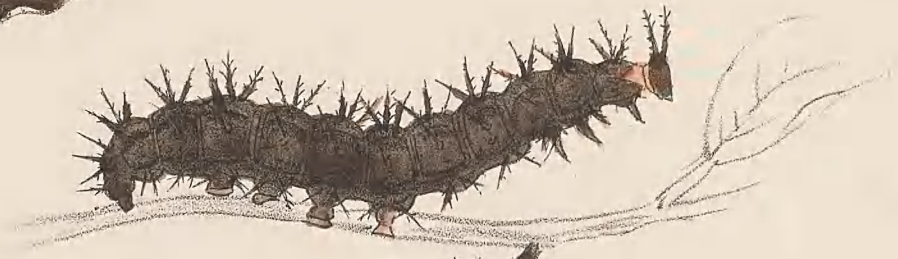
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1e



1d



1f



1g



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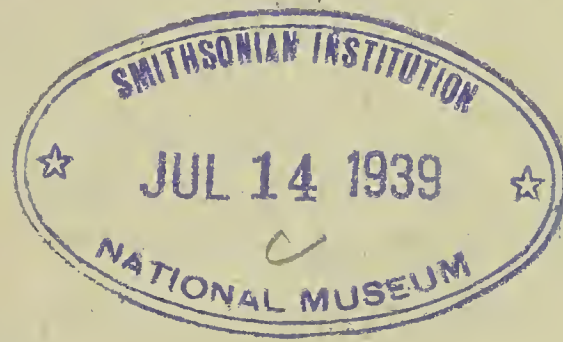
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(MS. Notes) remarks that *Philoxenus*, *Dasarada*, and *Ravana* fly together at Naini Tal, in September. Mr. H. J. Elwes possesses specimens from Hazara in the extreme N. W. Himalaya" (Tr. Ent. Soc. 1888, 426). A male taken at Murree in August, and a male from Dalhousie taken in May, are in the British Museum. General G. Ramsay obtained numerous specimens in Nepal, of which we possess examples of both sexes. Mr. Elwes records it as "common in Sikkim at the same elevations and in the same months as *Dasarada*" (Tr. Ent. Soc. 1888, 426). Mr. G. C. Dudgeon took it at Buxa, Bhotan. Col. C. Swinhoe has received many specimens from the Khasia and Jaintia Hills. Mr. Ossian Limborg obtained it on the roads from "Moulmein to Meetan, Upper Tenasserim, and from Moolait to Moolat at 4500 feet elevation, in December" (P. Z. S. 1878, 840). Dr. N. Manders found it "abundant in the Shan States, Burmah, and widely distributed" (Tr. Ent. Soc. 1890, 535). We possess both sexes from the Upper Mekong, Shan States, taken by Mr. J. Roberts, C.E. Mr. H. J. Elwes records a "single male from Ponkesai, Tavoy, Tenasserim" (J. A. S. Beng. 1886, 435). It also occurs in Siam, Tonkin, Western China, and the Malay Peninsula.

Of our illustrations on Plate 426, fig. 1 is from our drawing of the larva and pupa preserved by Mr. Hocking; and 1a, b, c, d, from male and female specimens taken in Nepal.

BYASA DASARADA (Plate 427, fig. 1, ♂, 1a, b, ♀).

- Papilio Philoxenus*, var. Westwood, Cabinet of Oriental Entom. p. 82, pl. 40, fig. 5, ♀ (1848).
Papilio Dasarada, Moore, Catal. Lep. Mus. E. I. Company, i. p. 96 (1857); *id.* Proc. Zool. Soc. Lond. 1865, p. 757. Oberthür, Etud. Ent. iv. p. 43 (1879). Staudinger, Exot. Schmett. i. p. 9 (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 425. Oberthür, Etud. Ent. xvii. p. 3 (1893).
Papilio (Panosmia) Dasarada, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374.
Byasa Dasarada, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.
Papilio (Byasa) Dasarada, de Nicéville, Sikkim Gazetteer, 1894, p. 171.
Papilio Philoxenus, aber. *Dasarada*, Rothschild, Nov. Zool. ii. p. 266 (1893).

IMAGO.—Both sexes larger than *B. Philoxenus*. Male. Upperside. *Forewing* rich fuliginous-black. *Hindwing* longer than in *B. Philoxenus*; rich dark blue-black, darkest posteriorly; the outer marginal angles, anal angle, and the tail much broader; with a single discal white patch, which is larger and less quadrate; the submarginal lunules narrower and recurved, the upper one being white, the lower one whitish anteriorly and sullied crimson posteriorly, the anal one crimson, the tail spot being more or less small and crimson, sometimes obsolescent or absent. Underside. *Forewing* uniformly paler than the upperside. *Hindwing* with the large discal white patch as on the upperside; a small white upper spot is generally present in

the subcostal interspace, and very rarely an indication of a lower minute spot in the basal interspace between the radial and upper median; the upper submarginal lunule is white and edged outwardly with crimson, the others and a short abdominal-marginal streak, and the tail spot are crimson, the lowest lunule being sometimes white-speckled anteriorly.

Female. Upperside. *Forewing* rich dark fuliginous, vein streaks well defined. *Hindwing* dark fuliginous-black basally, blue-black posteriorly; the discal white patch generally larger, and sometimes with an obsolescent or a distinct very small white spot below it, and also, but very rarely, with a moderate-sized white quadrate patch in the subcostal interspace above it; the three submarginal lunules and tail spot much larger than in the male, the upper lunule broad and with its outer upper-point prolonged, both lower lunules being white anteriorly; in some specimens faint traces of a short crimson-scaled streak extends from the anal angle, which in others is more distinct but paler; the tail spot large, either pale crimson or whitish. Underside. *Forewing* paler than upperside. *Hindwing* uniformly black; the discal large white patch as on the upperside. The lower small spot always present, the upper small spot either absent or very minute, or more generally of moderate large size; the marginal lunules as on the upperside, the anal marginal crimson irregular-shaped patch large.

Expanse, ♂ 5 to $5\frac{3}{4}$, ♀ 5 to 6 inches.

HABITAT.—Sikkim; Assam; Khasias; Burma; Tenasserim; Malacca; Shan States; Tonkin.

DISTRIBUTION AND HABITS.—“Occurs not uncommonly in Sikkim, Bhotan, and the Khasia Hills. In Sikkim it seems rarer than *Philoxenus*, and is found from 1000 to 8000 feet elevation, from April to November. I have not observed in this species the nauseous odour which, according to Mr. Wood-Mason, is characteristic of *Philoxenus*, but Mr. de Nicéville says it has the strongest smell of any butterfly he knows. The flight of this butterfly is much less swift than that of many *Papilios*. It may be seen sailing with a very soft graceful flight along the edge of the clearings and round the flowering trees in the open places. A species of *Albizzia* is one of the favourite trees, but to get fresh specimens one must search for those which, having recently emerged from the pupæ, may be found settled on the low herbage and flowers at the side of the forest-path” (H. J. Elwes, Tr. Ent. Soc. 1888, 426). “A common species in Sikkim, occurring from 1000 to 8000 feet from April till November. The butterfly has a very powerful and disagreeable odour, which is perceptible even years after the death of the insect” (L. de Nicéville, Sikkim Gaz. 1894, 171). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 312), and has also received many specimens from Cherra Punji and the Jaintia Hills. Mr. J. Wood-Mason obtained two females on Nemotha Peak, Cachar,

in September and October" (J. As. Soc. Bengal, 1886, 374). Col. C. H. E. Adamson "caught two males at Tounggya Sekkan, Upper Tenasserim, in May" (List Burm. Butt. 1897, 48). Col. C. T. Bingham obtained it at Thoungyen, Upper Tenasserim. We possess specimens from the Upper Mekong, Shan States, taken by Mr. J. Roberts, C.E. It also occurs in Malacca, and Tonkin.

BYASA RAVANA (Plate 428, fig. 1, 1a, ♂, 1b, c, ♀).

Papilio Philoxenus, var. Westwood, Cabinet of Oriental Entom. p. 81, pl. 40, fig. 4, ♀ (1848).

Papilio Ravana, Moore, Catal. Lep. Mus. E. I. Company, i. p. 96 (1857). Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Elwes, Trans. Ent. Soc. Lond. 1888, p. 423. Rothschild, Nov. Zool. ii. p. 262 (1895).

Byasa Ravana, Moore, Proc. Zool. Soc. Lond. 1882, p. 259.

Papilio (Byasa) Ravana, de Nicéville, Sikkim Gaz. 1894, p. 170.

IMAGO.—Male. Upperside. *Forewing* fuliginous-black, with a longitudinal black streak between the veins and similar streaks within the cell. *Hindwing* black, fuliginous basally; with an upper outer-discal white or pinky-white small spot, which is either quadrate, rounded, or obsolescent, or occasionally even absent, in the upper subcostal interspace, and a much larger elongate spot in the lower subcostal interspace, followed below by three submarginal normal-shaped lunules, the upper one broad, whitish and dull crimson scaled outwardly, the other two being narrow, recurved, and darker crimson scaled; the tail spot either small and crimson, or obsolescent; at the anal marginal angle, in some specimens, a few pale crimson scales are more or less present, and a portion of the crimson patch of the underside is visible at end of the marginal hairy lappet. Underside. Both wings paler than the upperside. *Hindwing* with markings as on the upperside; the large discal spot and upper submarginal lunule being outwardly crimson edged, the lower lunules and tail spot brighter crimson, the anal marginal irregular patch large and pale crimson or nearly white. *Thorax* and abdomen above black; streaks on front of thorax, collar, front of head, palpi, and sides of thorax beneath crimson; abdomen beneath crimson, with black lateral spots and segmental cross-bands; antennæ and legs black.

Female. Upperside. *Forewing* paler than in male. *Hindwing* also paler basally; the two upper-discal spots and the upper submarginal lunule somewhat larger and generally whiter, the two lower recurved lunules also larger and whiter anteriorly; the tail spot generally larger; an anal marginal irregular-shaped white patch always present extending from near the submedian to the middle or to the upper median and occasionally to the radial, thus forming a more or less broken lower discal band; occasionally a small white upper spot is also present in the

costal interspace. Underside similar to the upperside, except that the large discal spot and upper lunule are outwardly-edged with crimson, the lower lunules and tail spot being pale crimson, and the anal marginal patch partly crimson tinged.

Expanse ♂ 4 to $4\frac{1}{2}$, ♀ 4 to $4\frac{3}{4}$ inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—Mr. P. W. Mackinnon records it as “common in Tehri Garhwal, N. W. Himalaya, in April and May” (Journ. Bombay N. H. S. 1898, 592). Capt. Graham Young took it in Kulu (H. J. Elwes, Tr. Ent. Soc. 1888, 424). We possess specimens from Garhwal, taken by Col. Buckley, and from Nepal, taken by General G. Ramsay. Mr. E. T. Atkinson (MS. Notes) remarks that “*Ravana*, *Philoxenus*, and *Dasarada* fly together at Naini Tal, Kumaon, in September.”

BYASA NEVILLI (Plate 429, fig. 1, ♂).

Papilio Nevilli, Wood-Mason, Ann. and Mag. Nat. Hist. 1882, p. 105, ♂. Rothschild, Nov. Zool. ii. p. 263 (1895).

Papilio (Panosmia) Nevilli, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374, pl. 15, fig. 2, 2a, ♂.

Papilio Chentsong, Oberthür, Etudes Ent. xi. p. 13, pl. 1, fig. 1 ♂ (1886). Leech, Butt. of China, ii. p. 543 (1893).

IMAGO.—Male. Upperside. *Forewing* fuliginous-black, with a black longitudinal streak between the veins, and others within the cell. *Hindwing* paler fuliginous basally, black posteriorly; with two large upper-discal pink-white spots, placed in the subcostal interspaces, followed by the three lower submarginal bright crimson lunules, and a less-apparent dull crimson streak from the anal angle; a portion of the crimson spot of the underside being also visible at end of the abdominal fold; tail broad, not spatulate, entirely black. Underside. Similar. *Hindwing* with the two large pink-white spots as on the upperside, and with a very small upper pink spot in the costal interspace; the three lower bright crimson lunules larger, and a crimson broken patch crossing the submedian and lower median from the marginal anal angle.

Thorax and abdomen above black; streaks on thorax above, collar, front of head and palpi, and abdomen beneath crimson; abdomen beneath with black segmental cross-bands.

Female. Upperside paler. *Hindwing* with the two upper patches white, the upper submarginal lunule either white or very pale crimson.

Expanse, ♂ $4\frac{1}{2}$, ♀ 4 inches.

HABITAT.—Cachar; W. China.

DISTRIBUTION.—The type specimens of *B. Nevilli* are recorded from the “vicinity of Silchar, in Cachar” (W. Mason, *l.c.* p. 105).

BYASA LATREILLEI (Plate 430, fig. 1, 1a b, ♂, 1c, ♀).

Papilio Latreillii, Donovan, Nat. Rep. iv. pl. 140 (1826). Staudinger, Exot. Schmett. i. p. 9 (1884).

Elwes, Trans. Ent. Soc. Lond. 1888, p. 425. Rothschild, Nov. Zool. ii. p. 261 (1895).

Papilio Minereus, Gray, Zool. Misc. p. 32 (1831); *id.* Lep. Ins. Nepal, p. 5, pl. 1, ♀ (1846).

Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Westwood, Cab. Orient. Ent. p. 81, pl.

40, fig. 1 ♀ (1848). Moore, Catal. Lep. Mus. E. I. Company, i. p. 97 (1857). Felder, Verh.

Z. B. Ges. Wien. 1864, p. 325.

Papilio (Byasa) Latreillii, de Nicéville, Sikkim Gazetteer, 1894, p. 171; *id.* Journ. As. Soc. Bengal, 1897, p. 566.

IMAGO.—Male. Upperside. *Forewing* greyish fuliginous-black, with a black longitudinal streak between the veins, and others within the cell. Cilia black. *Hindwing* greyish fuliginous-black basally, deep black in the posterior interspaces; with a pinkish-white lower-discal patch composed of three portions placed in the interspaces between the lower median and the radial, the outer portions each excavated posteriorly, the inner one more truncated; beyond is an upper submarginal sullied-white or pale crimson-white small spot which is either oval or lunular, below this are the ordinary-placed lower submarginal lunules, a smaller spot at anal angle of lower median, and a tail spot, which are all small and either of a dull pale crimson or bright crimson; abdominal marginal lappet when unfolded displaying a longitudinal androconial patch of white dense woolly hairs. Underside much paler; greyish-fuliginous. *Hindwing* with the three lower discal patches and outer submarginal markings as on the upperside; the lower lunules and tail spot being brighter coloured; a slender continuous lower discal white streak edged with crimson is also present in the submedian interspace, and sometimes an upper white-speckled contiguous dot in the lower subcostal interspace, and also a submarginal small white lunule in the angle of the upper subcostal interspace. *Thorax* and abdomen above fuliginous black; front of thorax above and sides beneath, collar and front of head, and abdomen beneath crimson; abdomen beneath with black lateral spots and segmental cross-bands; anal valves crimson; antennæ and legs black.

Female. Wings broader. Upperside paler than in the male. *Hindwing* with the three portions of the lower-discal white patch somewhat larger, and with an inner narrow portion extending from the lower median to the marginal anal angle, this portion being sometimes crimson edged posteriorly, and also an upper small white or speckled-white spot in the lower subcostal interspace; the submarginal lunules and tail spot somewhat larger. Underside paler than the upper. *Hindwing* with markings as on the upperside, and also with a small white spot within the angle of the upper subcostal interspace, the submarginal lunules and tail spot brighter crimson.

Expanse, ♂ ♀, 4 to 4½ inches.

HABITAT.—N.W. and E. Himalayas.

DISTRIBUTION AND HABITS.—Mr. P. W. Mackinnon records it as “fairly common in May in the valleys to the N.E. of Masuri, N.W. Himalaya” (de Nicéville, J. Bombay N. H. S. 1898, 592). We possess specimens from Masuri, taken by Capt. T. Hutton, and also from Garhwal and Nepal, the latter taken by General G. Ramsay. Col. C. Swinhoe has it from Sikkim, taken in the Lachin Lachoong Valley, at 8000 feet elevation. Mr. H. J. Elwes records it as “not an uncommon species in Sikkim at from 7000 to 9000 feet elevation, where I have several times seen and taken it on Jellapahar, on Sinchal, and the Groompahar ridge. It frequents dense forest, where it flies high over the tops of the trees, from April or even sooner, on into July and August, when most of the females are worn and much broken. It may best be taken, like most of the high-flying forest insects, by waiting on a sunny day at an open space at the top of a hill, or when it occasionally comes down to settle on the path” (Tr. Ent. Soc. 1888, 425). Mr. L. de Nicéville also records it as “occurring in the thick, high forests of Sikkim, from 7000 to 9000 feet, from March to August.” (Sikkim Gaz. 1894, 171).

Our illustrations on Plate 430, figs. 1, 1a, b, represent the males with the abdominal fold both closed and open; and 1c, the female.

BYASA POLLA (Plate 429, fig. 2, ♂).

Papilio (Byasa) Polla, de Nicéville, Journ. As. Soc. Bengal, 1897, p. 565, pl. 4, fig. 28, ♂.

IMAGO.—Male. “Upperside. Both wings shining black. *Forewing* with the usual deep black longitudinal streaks within the cell, and similar ones between the veins. *Hindwing* with a large discal pinkish-white patch occupying the outer end of the cell, anteriorly bounded by the second subcostal, posteriorly by the first median nervule, the inner half of the portion in the first median interspace being heavily sprinkled with black scales; the outer edge of the patch is scalloped; four large submarginal carmine lunules all irrorated with black scales, the anterior one in the subcostal interspace whitish; tail broadly tipped with carmine; the posterior end of the abdominal fold and the two tooth-like projections of the wing-membrane between it and the tail, as well as the first projection beyond the tail, somewhat broadly edged with carmine.

Underside. Both wings as above, but of a darker shade of black. *Forewing* as on upperside. *Hindwing* with the discal pinkish-white patch extending quite up to the cell but not invading its outer end; the patch is inwardly continued from the first median nervule to the submedian nervule by a carmine spot; the submarginal lunules as above, but of a pure rich carmine, the two inner ones continued to the outer marginal carmine edging of the wing, which latter is broader than on the

upperside, as also is the carmine tip of the tail. *Palpi*, orbits, head, and thorax anteriorly carmine; thorax posteriorly and abdomen above black; thorax and abdomen beneath carmine; anal valves carmine; antennæ and legs black."

Female. Upperside much paler. *Forewing* fuliginous-brown; vein streaks black. *Hindwing* fuliginous-brown basally, black posteriorly; discal white patch similar to male, except that the upper portion is broader and shorter, its two lower portions also shorter and not reaching inwardly to the base of the interspaces, the lowest portion being extended for some distance into the submedian interspace; the portion within apex of the cell is also absent; the submarginal lunules, edges of the angles, and tail spot being sullied pinkish-white. Underside similar to the upperside. *Hindwing* with the lunules a little brighter, and with a small white submarginal spot in the subcostal interspace.

Expanse, ♂ 5, ♀ $4\frac{3}{4}$ inches.

HABITAT.—N. Shan States; N. China Hills, Upper Burma.

DISTRIBUTION.—Described by de Nicéville from a single male captured by Major F. B. Longe, R.E., in the Kokang State, at 3500 feet elevation, in the North Shan States, on the Chinese frontier east of Bhamo, April 5th, 1895. A worn female in Mr. Walter Rothschild's collection, from which our description of this sex is taken, was caught by Capt. E. Y. Watson in the North Chin Hills, Upper Burma, at 5000 feet elevation. A male, taken by Col. C. T. Bingham at Bernardmyo, Shan States, Burma, is also in the British Museum.

Our illustration on Plate 429, fig. 2, is copied from Mr. de Nicéville's figure of the male.

BYASA ADAMSONI (Plate 431, fig. 1, 1a ♂, 1b ♀).

Papilio Adamsoni, Grose-Smith, Ann. & Mag. Nat. Hist. 1886, p. 149, ♂; *id.* Rhop. Exot. 1, *Pap.* pl. 5, fig. 3, 4 ♂ (1888). Rothschild, Nov. Zool. ii. p. 262 (1895). De Nicéville, Journ. Bombay N. H. Soc. 1899, p. 334.

Papilio (Byasa) Minereoides, Elwes, and de Nicéville, Journ. As. Soc. Bengal, 1887, p. 435, pl. 20, fig. 2, 2b ♂, 3 ♀.

IMAGO.—Male. Upperside. *Forewing* fuliginous-black, darkest basally; with a black longitudinal streak between the veins and others within the cell. *Hindwing* black, palest basally; with a lower-discal white patch composed of three portions placed in the interspaces between the lower median and radial veinlets, or this patch is pinkish-white and composed of five portions extending from the anal marginal angle to the interspace above the radial, the upper portion being either small and contiguous, or united to the submarginal lunular spot in the same interspace, and thus forming a transverse band crossed by black veins; beyond are three submarginal narrow lunules, the upper one being white or pinkish-white, the

other two crimson. Tail entirely black. Underside paler. *Hindwing* with the discal patch composed of five portions, the upper portion small or united to the submarginal lunule of the same interspace, the anal portions and the veins being crimson edged, the three lower lunules larger and brighter crimson; in the subcostal interspace, above the discal band, there is also a narrow or broad white lunule.

Female. Upperside. *Forewing* much paler; greyish-fuliginous. *Hindwing* greyish-fuliginous basally, black posteriorly; the discal patch and submarginal lunules white; the patch composed of five portions, the upper portion united to the submarginal lunule of the same interspace; tails black. Underside as in the male. *Hindwing* with the discal band white, as on the upperside. *Thorax* and abdomen above black; collar, front of head, sides of thorax beneath, and abdomen beneath, crimson; abdomen beneath with black segmental cross-bands; anal valves crimson; antennæ and legs black.

Expanse, ♂ ♀ $3\frac{1}{2}$ to 4 inches.

HABITAT.—Upper Tenasserim; Shan States, Burma.

DISTRIBUTION.—The type specimens were taken by Col. C. H. E. Adamson, Madras Staff Corps, near the Siamese frontier in January, 1880. Mr. J. Wood-Mason records "a male from Simbyoodine, and a pair from Ponsekai, and a male in Major Marshall's collection taken in March, in the Thoungyeen forests, Upper Tenasserim" (*l.c.* p. 435). We possess males from Moulmein, and from Upper Mekong, Shan States, the latter taken by Mr. R. Roberts, C.E. "This species occurs apparently throughout Tenasserim, but is always rare. I have specimens from the Ataran Valley taken in March, the Thaungyin Valley taken in the same month, and the Daunat Range taken in January" (de Nicéville, J. Bombay N. H. S. 1899, 334).

BYASA BOOTES (Plate 432, figs. 1, 1a, ♂, 1b, ♀).

Papilio Bootes, Westwood, Ann. and Mag. Nat. Hist. 1842, p. 36; *id.* Arcana Ent. i. p. 123, pl. 31, ♂ (1843). Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Gray, Catal. Lep. B. M. i. p. 15 (1852). Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Moore, Proc. Zool. Soc. Lond. 1867, p. 672. Rothschild, Nov. Zool. ii. p. 335 (1895).

Byasa Bootes, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

IMAGO.—Male. Upperside. *Forewing* dark greyish fuliginous-black, blacker basally; with a black longitudinal streak between the veins and similar streaks within the cell; a few minute crimson scales generally present at base of the cell; cilia alternately edged with white. *Hindwing* more prolonged posteriorly than in *Janaka*; greyish fuliginous-black basally, deep black posteriorly; with a lower-discal white patch composed of two portions, the inner one, or both, very slightly

speckled with crimson scales posteriorly; in some specimens (from the same locality) a very small but much shorter similar spot is also present, and in others, again, an outer very small short rounded black-speckled white spot is occasionally also present; beyond are either two, more generally three, submarginal slender crimson lunules, the inner one being above the anal angle, followed by four corresponding outer-marginal broader and shorter crimson lunules, which latter are more or less white-speckled and with white cilia, the upper incisions of the wing also with white cilia; tail with duplex white spot. Underside. Somewhat paler. *Forewing* with a crimson patch at the base. *Hindwing* with a crimson basal patch, the lowest portion of which is short and restricted to the base of the median and submedian interspace; discal white patch as on the upperside; the submarginal and marginal crimson lunules larger and broader than on the upperside. *Thorax* and abdomen above black; front of thorax and collar, front of head, sides of thorax beneath, and abdomen beneath crimson; abdomen beneath with black lateral spots and segmental cross-bands; anal valves black, narrow and pointed at the apex; antennæ and legs black.

Female. Upperside somewhat paler than in male. *Hindwing* with the discal white patch composed of three portions and an upper very small rounded black-speckled spot; the submarginal crimson narrow lunules and marginal short lunules as in the male. Underside paler. *Hindwing* with markings as on the upperside.

Expanse, ♂ ♀ $4\frac{1}{2}$ to $4\frac{3}{4}$ inches.

HABITAT.—Assam.

DISTRIBUTION.—Col. C. Swinhoe records it (*l.c.* p. 312) from “Shillong and Cherra Punji, Assam,” and has also since received numerous specimens from the Jaintia Hills.

BYASA JANAKA (Plate 433, figs. 1, 1a, ♂, 1b, ♀).

Papilio Janaka, Moore, Catal. Lep. Mus. E. I. Company, i. p. 97 (1857); *id.* Proc. Zool. Soc. Lond. 1857, p. 104, pl. 45, fig. 1, 1a, ♂. Felder, Verh. Z. B. Ges. Wien. 1864, p. 325. Elwes, Trans. Ent. Soc. Lond. 1888, p. 426. Haase, Untersuch. ub. Mim. p. 53, pl. 5, fig. 36, ♀ (1893). Rothschild, Nov. Zool. ii. p. 336 (1895).

Papilio (Panosmiopsis) Janaka, de Nicéville, Sikkim Gazetteer, 1894, p. 171.

Papilio Sikkimensis, Wood-Mason, Ann. and Mag. Nat. Hist. 1882, p. 103, ♂.

Papilio (Panosmiopsis) Bootes, Mackinnon and de Nicéville, Journ. Bombay N. H. Soc. 1898, p. 593.

IMAGO.—Male. Upperside. *Forewing* dark greyish fuliginous-black, with a black longitudinal streak between the veins, and others within the cell; a more or less apparent short dark crimson-scaled streak at base of the cell; cilia alternately edged with white. *Hindwing* olivescient greyish-fuliginous basally, deep black posteriorly; with a lower-discal white patch composed of three portions, which are

either fusiform in shape, or broadest at their lower ends, the inner portion being the shortest, and in some specimens an outer or upper fourth portion is also present, which latter is also small and more or less rounded and speckled with black scales, the three lower portions also being posteriorly edged with crimson scales; beyond are either four, or five, submarginal narrow crimson lunules, the upper one, when present, being almost white; below them are four marginal smaller crimson lunules edged with white cilia, the cilia of the upper incisions being also white; in some specimens the submarginal lunules are more or less obsolescent or partly obsolete; tail duplex-spot pale crimson or whitish, small, sometimes obsolescent.

Underside. Both wings paler. *Forewing* with a crimson patch at the base. *Hindwing* with a crimson basal patch and a continuous lengthened streak along the interspace between the median and submedian; the discal white patch as above, the two inner portions slightly speckled with crimson scales externally, or each is so speckled at both ends, and in some specimens the inner portion is entirely covered with crimson scales; the four lower submarginal crimson lunules and marginal lunules are prominent and broad, the anal pair being partly coalesced; two upper, or fifth and sixth, smaller white narrow lunules are generally present in the subcostal interspaces, and sometimes even a minute seventh in the costal interspace.

Female. Upperside somewhat paler. *Forewing* with a small crimson basal cell spot. *Hindwing* with the discal white patch composed of three nearly equal portions and a contiguous very small upper spot, the five submarginal and the lower marginal lunules duller coloured, the two upper submarginal lunules and the tail spot being almost or quite white. Underside as in the male.

Expanse, ♂ ♀ $4\frac{1}{2}$ to $4\frac{3}{4}$ inches.

HABITAT.—N.-W. and E. Himalayas.

DISTRIBUTION.—Mr. P. W. Mackinnon found it "rare in Tehri Garhwal, N.-W. Himalaya, in May" (de Nicéville, J. Bombay N. H. Soc. 1898, 593). We possess specimens of both sexes from Garhwal. Mr. H. J. Elwes records it as "a rather rare species in Sikkim, where it is found at from 3000 to 5000 feet elevation, in May and June" (Tr. Ent. Soc. 1888, 426). Mr. W. Rothschild has several specimens from Sikkim" (Nov. Zool. ii. 326).

BYASA PEMBERTONI (Plate 434, fig. 1, ♂, 1b, ♀).

Papilio Alcinous (part), Moore, Catal. Lep. Mus. E. I. Compy. i. p. 95 (1857).

Papilio Plutonium, Elwes, Trans. Ent. Soc. Lond. 1888, p. 424 (*nec* Oberthür).

Papilio (? *Byasa*) *Plutonium*, de Nicéville, Sikkim Gazetteer, 1894, p. 171.

Papilio Alcinous Plutonium (part), Rothschild, Nov. Zool. ii. p. 271 (1895).

IMAGO.—Male. Upperside fuliginous-black; with black veins. *Forewing* with a black longitudinal streak between the veins and similar streaks within the cell.

Hindwing with five submarginal pale pinkish or flesh-colour broad lunular spots, each surrounded by black darker than the basal ground-colour. Underside paler, greyish fuliginous. *Forewing* as above. *Hindwing* with seven submarginal flesh-coloured lunular spots, all except the upper somewhat broader than those on the upperside.

Female. Upperside pale olivescient greyish-fuliginous. *Forewing* with black veins and streaks. *Hindwing* with the submarginal pale flesh-colour lunules slightly larger than in the male, and with their surrounding marginal borders dull dark black. Underside slightly paler than upperside. *Hindwing* with six submarginal pale flesh-colour lunules and a similar coloured broad anal lunule, as in male, the surrounding marginal border duller black. *Thorax* and abdomen above fuliginous-black; collar, front of head, sides of thorax beneath, and abdomen beneath pale crimson; segmental bands on abdomen beneath black; antennæ and legs black.

Expanse, ♂ ♀ 4 to $4\frac{4}{10}$ inches.

HABITAT.—Bhotan.

Described from two males, collected by Major R. B. Pemberton during his Mission to Bhotan in 1837-8, now in the British Museum collection, and from a female in Mr. W. Rothschild's Collection, labelled Chumbi? taken by Mr. Otto Möller's native collectors. Mr. H. J. Elwes has "two females, in bad condition, taken by his native collectors in the interior, probably from Bhotan, in 1884" (Tr. Ent. Soc. 1888, 424).

BYASA CRASSIPES (Plate 434, fig. 2, ♂).

Papilio crassipes, Oberthür, Etudes Ent. xvii., p. 2. pl. 4, fig. 38, 38a, ♂ (1893). Rothschild, Nov. Zool. ii. p. 262 (1895). Fruhstorfer, Soc. Ent. 1901, p. 113.

IMAGO.—Male. Upperside. *Forewing* dark fuliginous-black, with black veins, a longitudinal streak between the veins and streaks within the cell. *Hindwing* very narrow anteriorly and much prolonged posteriorly, exterior margin broadly scalloped, tail very broad and short; abdominal margin with a very long folded lappet, which when opened displays a lengthened greyish-white woolly androconial patch; colour dull greyish-black, with two upper marginal and two subanal lunules and tip of the tail very obscure dusky red. Underside. *Forewing* paler. *Hindwing* dull black, with the two upper and lower marginal lunules, an irregular-shaped anal lunule and the tail tip bright crimson. *Thorax* and abdomen above black; front of thorax and head, and abdomen beneath crimson; abdomen beneath with black segmental bands; hind tibiæ very thick; antennæ and legs black.

EXPANSE, ♂ $4\frac{1}{2}$ inches.

HABITAT.—Tonkin. Siam frontier, S. Shan States.

Our description and figure of this species is from a male in the possession of Mr. W. Rothschild, taken in the Nam Hla Valley, Siam frontier, S. Shan States, at 2500 feet elevation. Mr. H. Fruhstorfer (*l.c.*) records it from "Than-Moi, 1000 feet, Kalao, taken in May and June." The type specimen is stated to be from Tonkin.

CHINA AND JAPAN SPECIES.—*Byasa Lama* (*Papilio Lama*, Oberthür, Etudes Ent. ii. p. 15, pl. 3, fig. 1, ♀ (1876); *id.* iv. p. 43 (1879). *Pap. Philoxenus subsp. Lama*, Rothschild, Nov. Zool. ii. p. 266 (1895). Leech, Butt. of China, Japan, &c., ii. p. 537 (1893). *Habitat.* W. and C. China.—*Byasa Alcinous* (*Papilio Alcinous*, Klug, Neue Schmett. Ins. Samml. Berlin, pl. 1, fig. ♂ ♀ (1836). De Haan, Verh. Nat. Gesch. Ned. p. 26—*nec. pl. 9, fig. larva* (1840). De L'orza, Lep. Jap. p. 11 (1869). Pryer, Rhop. Nippon, p. 4, pl. 5, fig. 3, ♀ (1886). Leech, *l.c.* p. 539 (1893). Rothschild, *l.c.* p. 267-8 (1895). *Syn. Pap. Spathatus*, Butler, Ann. Nat. Hist. 1881, p. 139. *Pap. hæmotostictus*, Butler, *l.c.* p. 140. *Habitat.* Japan.—*Byasa Mencius* (*Papilio Mencius*, Felder, Wien. Ent. Mon. vi. p. 22, ♂ ♀ (1862). *Pap. Alcinous subsp. Mencius*, Rothschild, *l.c.* p. 268. *Habitat.* China.—*Byasa Plutonium* (*Papilio Plutonium*, Oberthür, Etud. Ent. ii. p. 16, pl. 3, fig 2, ♂ (1876). Leech, *l.c.* p. 541 (1893). *Pap. Alcinous subsp. Plutonium*, Rothschild, *l.c.* p. 271. *Habitat.* W. China.—*Byasa Loochooana* (*Pap. Alcinous Loochooana*, Rothschild, *l.c.* iii. p. 421 (1896). *Habitat.* Okinawa, Loo Choo Islands.—*Byasa Mansonensis* (*Pap. Alcinous Mansonensis*, Fruhstorfer, Soc. Ent. 1901, p. 113. *Habitat.* N. Tonkin.—*Byasa Nigricans* (*Pap. Bootes subsp. Nigricans*, Rothschild, *l.c.* ii. p. 335, ♂ (1895). *Pap. Bootes*, Leech, *l.c.* p. 551 (1893). *Habitat.* W. China.—*Byasa dealbata* (*Pap. Janaka subsp. dealbatus*, Rothschild, *l.c.* ii. p. 336, ♂ (1895). *Habitat.* W. China.

Genus TROS.

Tros, Barbutt, Genera Ins. Linné, p. 168 (1781). Kirby, Allen's Nat. Hist. Butt. ii. p. 305 (1896).

Papilio (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

Menelaides (part), Hübner, Verz. bek. Schmett. p. 84 (1816).

Papilio (group I. part), Rothschild, Nov. Zool. ii. p. 233 (1895).

IMAGO.—Male. *Forewing* elongate, triangular; apex convex, exterior margin very oblique and slightly waved, posterior margin short and almost straight; cell very long. *Hindwing* short anteriorly, produced posteriorly, exterior margin scalloped and with a narrow tail at end of upper median veinlet; abdominal margin not folded; basal area from the costa to below the median vein and its branches, thickly clothed with fine long hairs. *Body* moderately stout; apex of abdomen without valves; posterior tibia not incrassated, clothed with fine short spiny scales; antennæ with a gradually thickened club.

LARVA.—Cylindrical, tapering towards each end; with a subdorsal and two

lateral rows of fleshy cylindrical tubercles, the lowest rows shortest; an additional lateral tubercle on 3rd and 4th segment.

PUPA.—Head truncate in front; thorax dorsally conical and laterally rounded; wing-cases posteriorly rounded and dilated; abdominal segments with four subdorsal short foliaceous protuberances.

TYPE.—T. Hector.

TROS HECTOR (Plate 435, fig. 1, *larva* and *pupa*, 1a, ♂, 1b, ♀).

- Papilio Hector*, Linnæus, Syst. Nat. ed. x. p. 459 (1758); *id.* Mus. Ulr. p. 183 (1764); Syst. Nat. ed. xii. p. 745 (1767). Clereh, Icon. Ins. ii. pl. 33, fig. 1 (1764). Fabricius, Syst. Ent. p. 443, (1775). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 1 (1776). Cramer, Pap. Exot. ii. p. 67, pl. 141, fig. A ♂ (1777). Fabr. Spec. Ins. ii. p. 2 (1781): *id.* Ent. Syst. iii. 1, p. 3 (1793). Esper, Ausl. Schmett. p. 15, pl. i. fig. 2 (1784); *id.* p. 246, pl. 40, fig. 2, 3 (1798). Jablonsky, Nat. Schmett. ii. p. 137, pl. 13, fig. 2 (1784). Godart, Encyc. Meth. ix. p. 70 (1819). Lucas, Lep. Exot. p. 8, pl. 4, fig. 2 (1835). Boisduval, Spec. Gen. Lep. i. p. 269 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 39 (1840). Westwood, Arc. Entom. i. p. 9, pl. 3, figs. 1—4 (1845). Doubleday and Hewitson, Gen. D. Lep. i. p. 9 (1846). Gray, Catal. Lep. B.M. i. p. 11 (1852). Chenu, Enc. d'Hist. Nat. pl. 5, fig. 1 (1851). Moore, Catal. Lep. Mus. E.I.C. i. p. 93, pl. 2, fig. 4, 4a, b, *larva* and *pupa* ((1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 326, 375. Moore, Proc. Zool. Soc. Lond. 1865, p. 756. Butler, Catal. Fabr. Lep. B.M. p. 258 (1869). Oberthür, Etud. Ent. iv. p. 44 (1879). Staudinger, Exot. Schmett. i. p. 6, pl. 3, ♂ (1884). Rothschild, Nov. Zool. ii. p. 223 (1895).
- Tros Hector*, Barbut, Gen. Ins. Linné, p. 168, pl. 10, fig. 2 (1781). Kirby, Allen's Nat. Hist. Butt. ii. p. 305 (1896).
- Princeps Heroicus Hector*, Hübner, Samml. Exot. Schmett. i. pl. 110, fig. 1, 2 (1806—19).
- Menelaides Hector*, Hübner, Verz. bek. Schmett. p. 84 (1816). Moore, Lep. of Ceylon, i. p. 152, pl. 58, fig. 2 (1881). Swinhoe, Proc. Zool. Soc. Lond. 1885, p. 142.
- Aërnauta Hector*, Berge, Schmett. p. 108, pl. 37, fig. 1, ♂ (1842).
- Papilio (Menelaides) Hector*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 52. Hampson, *ib.* 1888, p. 363.

IMAGO.—Male. Upperside. *Forewing* bluish-black; with an outwardly-oblique transverse medial interrupted band composed of white or ochreous-white short indented streaks, and three, sometimes four, similar-coloured subapical streaks, the latter series being occasionally continued to the discal band by means of white discal linear marks between the radial and upper median veinlet; cilia alternated with white. *Hindwing* richer bluish-black; the basal area densely clothed with fine silky brownish hairs; a discal transverse curved series of seven bright crimson spots, the last one being at the anal angle, and of which the three lower discal are the smallest and sometimes very small; followed by a submarginal row of bright crimson lunules; in some specimens all these spots are of a duller and paler crimson; cilia alternated with white. *Thorax* and base of abdomen, legs and antennæ black; front

of head, palpi, collar, sides of thorax beneath, and anal half of abdomen crimson; sides of abdomen with a row of black dots.

Female. Upperside somewhat paler. *Forewing* with the transverse interrupted bands ochreous-white. *Hindwing* with the discal series of spots much paler and somewhat ochraceous, and the sub-marginal lunules paler and duller crimson. Under-side as in the male.

Expanse, ♂ $3\frac{1}{2}$ to $4\frac{1}{2}$, ♀ $4\frac{1}{4}$ to $4\frac{3}{4}$ inches.

LARVA.—Cylindrical, tapering slightly towards each end; rich dark purple-brown; with a sub-dorsal and two lateral rows of crimson fleshy cylindrical tubercles, the lowest row shortest, and an additional lateral tubercle on the third and fourth segment; a transverse row of four pinkish-white spots on the seventh and eighth segment; head and legs blackish.

PUPA.—Head truncate in front; thorax dorsally conical and laterally rounded; wing-cases posteriorly rounded and dilated; abdominal segments with four subdorsal short foliaceous protuberances; colour pale violaceous-ochreous.

HABITAT.—Lower India (Central Provinces, Bombay, Madras); Ceylon; Calcutta; Chittagong.

DISTRIBUTION.—This butterfly has a rather restricted range. Mr. W. Rothschild cites specimens from the "Central Provinces" (*l.c.* 234). Col. C. Swinhoe obtained it at "Poona, Bombay, in March and June; at Belgaum in October, and in Bombay in July, September, and October" (*P. Z. S.* 1885, 145). Mr. J. Davidson and E. H. Aitken (*J. Bombay N. H. S.* 1890, 362) say, "larvæ were found, in Bombay, throughout the monsoon, and once in April, on a plant near water, which had retained some green leaves. In June, when they first appeared, it was difficult to get food for them, as the young shoots of *Aristolochia* had scarcely begun to sprout. The egg must have been laid on the dry stalks of last season." "The butterfly is very common, in the Kanara District of Bombay, at the same time as *Ornith. Minos*, but it is of course more plentiful at all seasons" (*ib. l.c.* 1896, 577). Mr. S. N. Ward (*MS. Notes*) records it as "common all over the Peninsula, and is, I think, the commonest species of its tribe, which may be accounted for by its frequenting low flowering shrubs and herbs, such as grow by the road side. It is found on the Hills, both Nilghiri and Shevaroy, though not so commonly as lower down. It lasts from May to September. Its larva feeds upon *Aristolochia indica*. Its changes occupy ten days or a fortnight." Mr. R. S. Eaton observed that "in the Bombay Presidency, during the latter part of the rains (Sept.—Dec.) in the beginning of the cold weather, this butterfly commonly roosts in flocks. About sunset they betake themselves to trees—usually the 'Babul,' a species of *Acacia*—clinging to the underside of the subpendulous branches towards their extremities in crowds of many hundreds; and there they rest until the

sun is well up" (Ent. Mo. Mag. 1880, 276). Mr. G. F. Hampson obtained it on the "Nilgiris at from 1000 to 7000 feet elevation" (J. As. Soc. Bengal, 1888, 363). Sir W. Elliot "found and reared the larva on *Aristolochia*, in October, at Simachellum, Madras" (MS. Notes). Capt. E. Y. Watson records it as very common in Madras from June to September" (J. As. Soc. Bengal, 1890, 268). Common at Kolar in October, and at Nelamangala, Mysore, in January" (*id.* J. Bombay N. H. S. 1890, 9). Mr. H. S. Ferguson records it as "very common in Travancore, both in low country and on the lower slopes of the Hills" (*ib.* 1891, 446). Mr. J. Rothney found it "common in Barrackpore Park, near Calcutta, from March to October" (Ent. Mo. Mag. 1882, 73). Mr. L. de Nicéville says it is "rare in Calcutta, but taken commonly at Chandernagore in November. Has a strong scent. Larva feeds on *Aristolochia*" (J. As. Soc. Bengal, 1885, 52). Mr. W. C. Taylor records it as "common at Khorda in Orissa" (List 1888, 16). We possess a male taken in Chittagong, in September. In Ceylon, it is "common in the low country at certain seasons of the year, generally after the first outbreak of the two monsoons. It is abundant at Colombo" (Dr. N. Manders, J. As. Soc. Beng. 1899, 221). Col. J. W. Yerbury took it at Trincomali in September. Mr. F. M. Mackwood records it as a "low country butterfly in Ceylon, and found occasionally about 2000 feet elevation. Very abundant in the early months of the year, but occurs all through the year" (Lep. Ceylon, i. 152).

Of our illustrations on Plate 435, fig. 1, larvæ and pupæ are from Sir W. Elliot's Madras drawings, and fig. 1a, b, the male and female.

Genus MENELAIDES.

Menelaides, Hübner, Verz. bek. Schmett. p. 84 (1816). Moore, Lep. of Ceylon, i. p. 151 (1881).

Kirby, Allen's Nat. Hist. Butt. ii. p. 304 (1896).

Papilio (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

Papilio (Group I. part), Rothschild, Nov. Zool. ii. p. 233 (1895).

IMAGO.—Male. *Forewing* elongated, somewhat narrow, triangulated; apex very convex, exterior margin long and oblique, posterior margin short; cell long and narrow, extending to two-thirds the wing; first subcostal branch emitted at two-fifths and second at one-fifth before the end of the cell; upper discocellular shortest. *Hindwing* very short anteriorly, narrow, produced posteriorly; exterior margin scalloped and furnished with a more or less developed tail; abdominal margin slightly folded and grooved alongside of the submedian vein; cell short, broadest across the middle; first subcostal emitted at one-fourth before end of the cell; upper discocellular very long and oblique, twice the length of the lower. *Body* moderately slender, anal segment not valved; posterior tibia thickly incrassated from

near base to the tip, and densely clothed with rather long lax spiny scales; antennal club gradually thickened.

TYPE.—*M. Polydorus*, Linn.

MENELAIDES JOPHON (Plate 436, fig. 1 *larva*, 1a, ♂, 1 b, ♀).

Papilio Jophon, Gray, Catal. Lep. Brit. Mus. i. p. 10, pl. 4, fig. 4 ♀ (1852); *id.* List. Lep. B. M. p. 11 (1856). Felder, Verh. Z. B. Ges. Wien. p. 326 (1864). Haase, Untersuch. ub. Mim. p. 24 (1893). Rothschild, Nov. Zool. ii. p. 234 (1895).

Menelaides Jophon, Moore, Lep. of Ceylon, i. p. 152, pl. 58, fig. 1 ♀ (1881); *ib.* ii. p. 533, pl. 210, fig. 6, *larva*.

IMAGO.—Male. Upperside rich virescent brownish-black. *Forewing* with a sullied greyish-white short forked streak between the outer veins, those above the third median veinlet slender, those below very broad, less forked, and prominent; within the cell are four short similar coloured narrow streaks, the upper one obsolescent, which are superposed above the interspace of the lower medians. *Hindwing* with a large sullied-white central rounded patch extending across outer-half of the cell and the basal interspaces from the upper subcostal to the submedian vein; beyond is a submarginal series of five ill-defined narrow black-speckled dusky crimson lunules. Underside. *Forewing* paler virescent-brown, the streaks whiter and more prominent. *Hindwing* with the central white patch more prominent and with an upper small white spot present in the costal interspace; followed by a submarginal series of six crimson lunules and a crimson lunule at anal angle. *Thorax* and abdomen above and beneath to near the tip, black; collar behind the eyes edged with white; frontal tuft brown; palpi dull pale crimson; sides of thorax beneath, tip and sides of abdomen above and beneath crimson, the latter with black lateral spots and segmental bands; antennæ and legs black.

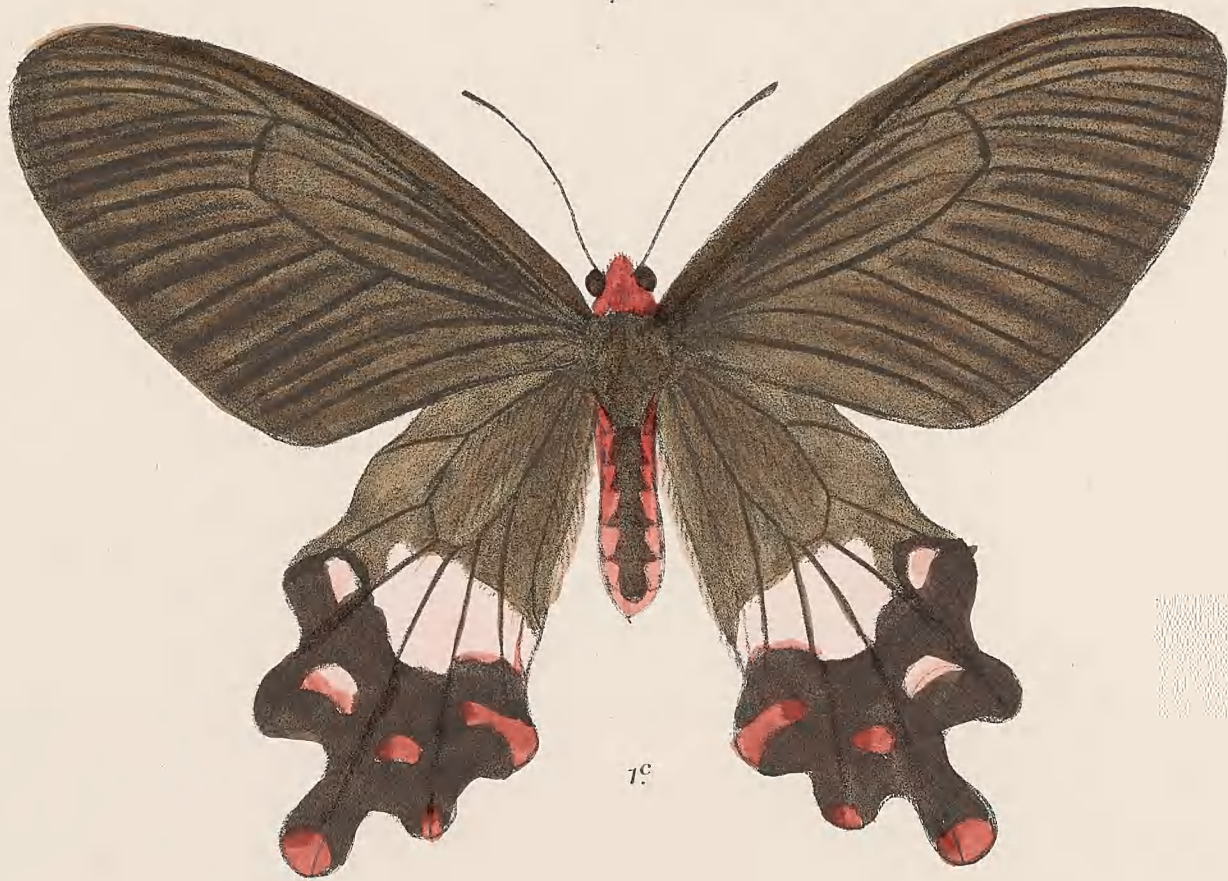
Female. Upperside. *Forewing* broader; vein and cell streaks as in the male, more prominent and whiter. *Hindwing* as in the male, with the central patch whiter; the elongated streak in the submedian interspace slightly tipped with pale crimson scales. Underside as in the male.

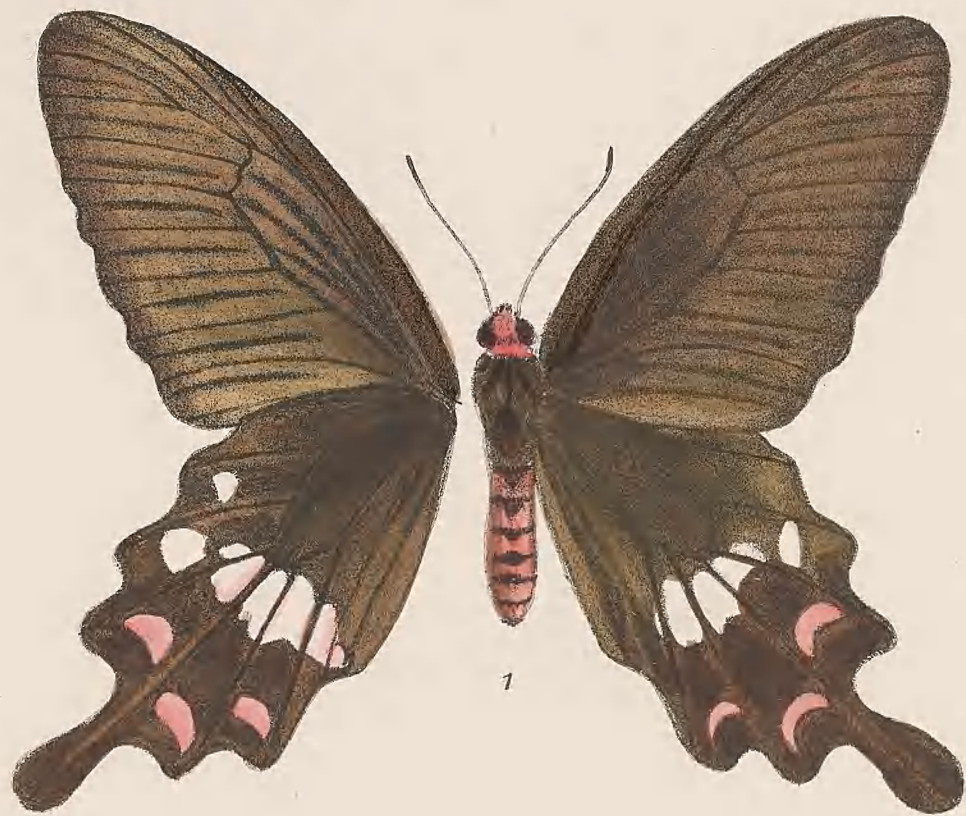
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LARVA.—“Dark purple-black, with crimson coloured pointed tubercles, two on 2nd segment, eight on each of 3rd and 6th, six on each of 8th to 10th, and four on 13th; seventh segment with a pale cream-coloured transverse band (interrupted on the dorsal line) including four tubercles of the same colour, below which on each side is a single crimson tubercle; on second segment is a band composed of four pale tubercular-spots, from the centre of which can be protruded a pair of short blunt yellow tentacles.”









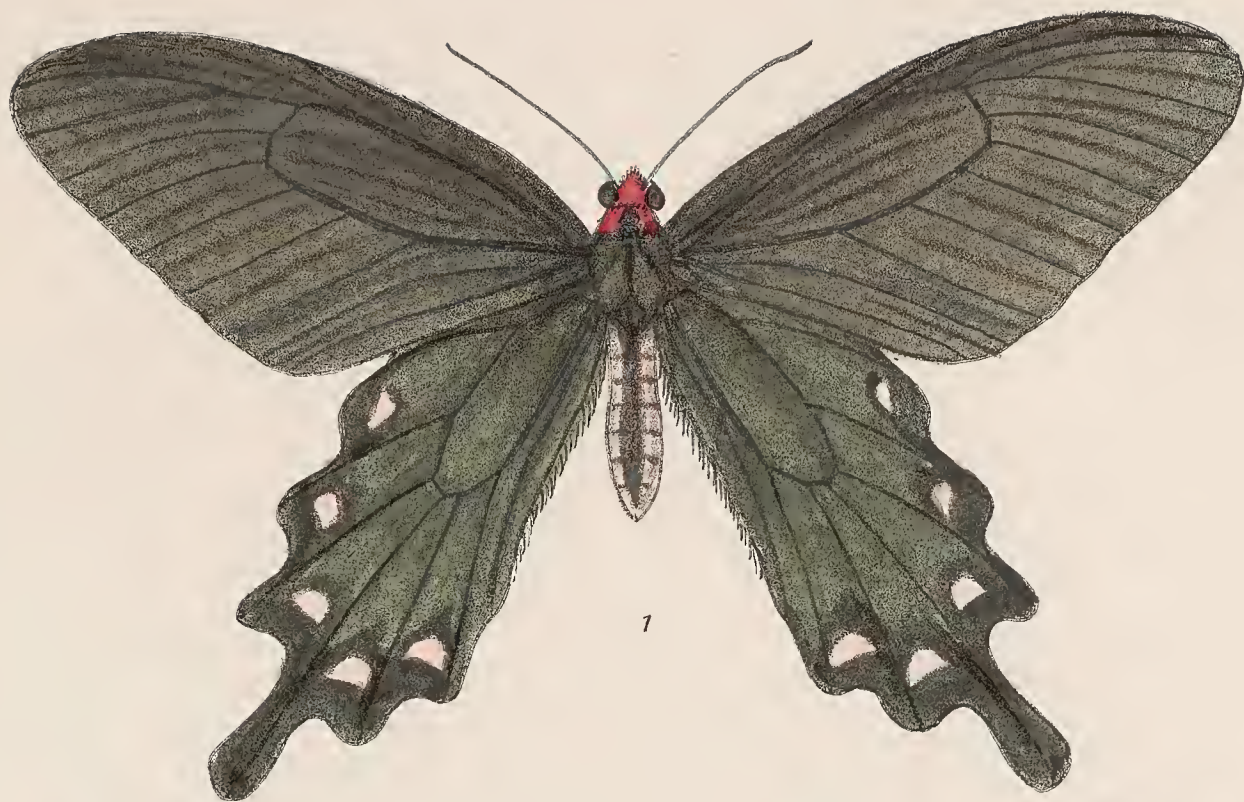




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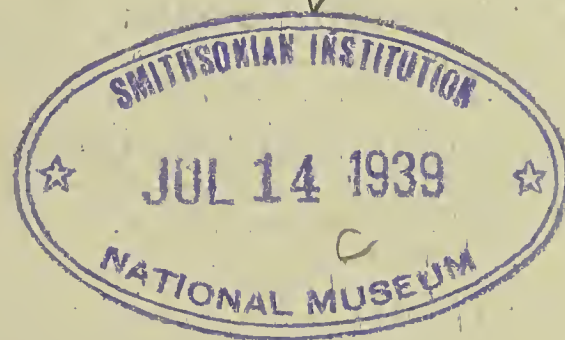
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Of our illustrations on Plate 436, fig. 1 is from a drawing of the larva by Mr. E. Ernest Green, and figs. 1a, b, are of male and female.

MENELAIDES PANDIYANA (Plate 437, fig. 1, 1a, ♂, 1b, ♀).

Papilio Pandiyana, Moore, Trans. Ent. Soc. Lond. 1881, p. 313.

Papilio (Menelaides) Pandiana, Hampson, Journ. As. Soc. Bengal, 1888, p. 363.

Papilio (Menelaides) Pandiyana, Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446.

Papilio Pandiyanus, Rothschild, Nov. Zool. ii. p. 234 (1895).

IMAGO.—Male. Allied to *Jophon*. *Forewing* narrower. Upperside with the pale streaks between the outer veins longer and with a linear intervening black streak, the upper cell-streaks extending to the end; a short whitish streak also present below the submedian vein. *Hindwing* with the cell longer, the discal sullied-white patch extending from two-thirds before end of the cell and there traversed within by two longitudinal slender obscure blackish lines, the portions in the outer interspaces being broader and shorter, and with an upper large quadrate spot in the costal interspace; six submarginal obscure dusky crimson lunules, and one at the anal angle. Underside. *Forewing* paler; vein streaks paler. *Hindwing* with the discal patch, as on upperside, whiter; the six submarginal lunules and the anal lunule prominent, broad, pure pink. *Thorax* and abdomen black, tip of abdomen ochreous; frontal tuft and palpi pale ochreous.

Female. Upperside similar to the male. *Hindwing* with the outer portions of the discal whitish patch externally speckled with dusky scales, the upper or costal portion is small or divided into two; the submarginal lunules and anal lunule somewhat broader. Underside similar to the upper, the streaks on forewing and discal patch on hindwing whiter, the submarginal lunules and anal lunule as in the male.

Expanse, ♂ 4, ♀ $4\frac{1}{4}$ inches.

LARVA.—Unknown.

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MENELAIDES ARISTOLOCHIÆ.

Dry-season form (Plate 441, fig. 1, larva and pupa; 1a, ♂, 1b, ♀; 1c, ♂, 1d, ♀).

- Papilio Aristolochiæ*, Fabricius, Syst. Ent. p. 443 (1775). Goeze, Ent. Beyt. iii. 1, p. 40 (1779). Butler, Catal. Fabr. Lep. B. M. p. 258 (1869). Moore, Proc. Zool. Soc. Lond. 1878, p. 840. Oberthür, Etudes Ent. iv. p. 43 (1879); *id.* xvii. p. 3 (1893). Elwes, Tr. Ent. Soc. Lond. 1888, p. 427. Manders, *ib.* 1890, p. 535. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 362. Leech, Butt. of China, ii. p. 554 (1893). Rothschild, Nov. Zool. ii. p. 245 (1895). *Menelaides Aristolochiæ*, Moore, Proc. Zool. Soc. Lond. 1882, p. 259. Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 313.
- Papilio (Menelaides) Aristolochiæ*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 52. Doherty, *ib.* 1886, p. 137. Wood-Mason and de Nicéville, *ib.* 1886, p. 376. Elwes and de Nicéville, *ib.* 1886, p. 435. Hampson, *ib.* 1888, p. 363. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446. de Nicéville, Sikkim Gazetteer, 1894, p. 171.
- Papilio Polidorus*, Cramer, Pap. Exot. ii. p. 45, pl. 128, fig. A, B (1777), *nec* Linné.
- Papilio Polydorus*, Jablonsky, Nat. Schmett. ii. p. 201, pl. 15, fig. 3 (1784).
- Princeps Heroicus Polydorus*, Hübner, Samml. Exot. Schmett. i. pl. 111 (1806-19).
- Papilio Polydorus* (part), Hübner, Verz. bek. Schmett. p. 84 (1816).
- Papilio Polydorus*, Horsfield, Catal. Lep. Mus. E. I. Company, pl. 3, fig. 17, larva (1828). De Haan, Verh. Nat. Gesch. Ned. p. 38, pl. 8, fig. 1 (1840).
- Papilio Hector* (part), Fabricius, Spec. Ins. ii. p. 2 (1781). Jablonsky, Nat. Schmett. ii. p. 201 (1784). Esper, Ausl. Schmett. p. 15 (1784).
- Papilio Diphilus*, Esper, Ausl. Schmett. p. 156, pl. 40, fig. 2 (1792). Gray, Catal. Lep. B. M. 1, p. 10 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 94, pl. 2, fig. 5, 5a, larva (1857). Felder, Verh. Z. B. Ges. Wien. 1864, p. 326. Lang, Ent. Mo. Mag. 1864, p. 101. Wallace,

- Trans. Linn. Soc. Lond. 1865, p. 43. Moore, Proc. Zool. Soc. Lond. 1865, p. 756; *ib.* 1866, p. 356. Druce, *ib.* 1874, p. 109. Butler, Trans. Linn. Soc. Zool. 1877, p. 553.
- Aërnauta Diphilus*, Berge, Schmett. p. 108, pl. 36, fig. 1, ♀ (1842).
- Papilio* (*Menelaides*) *Diphilus*, Swinhoe, Proc. Zool. Soc. Lond. 1884, p. 512.
- Papilio Aristolochiæ*, var. *Diphilus*, Distant, Rhop. Malayana, p. 337, pl. 31, fig. 6, 7 (1885).
- Menelaides Diphilus*, Swinhoe, Proc. Zool. Soc. Lond. 1885, p. 145, *ib.* 1886, p. 433. Moore, Journ. Linn. Soc. Zool. 1886, p. 51.
- Papilio Adamas*, Zinken-Sommer, Nova Acta Acad. Cur. xv. p. 144 (1831).
- Polydorus Thoas*, Swainson, Zool. Illustr. ii. pl. 100, ♂ (1833).

IMAGO.—Male. Upperside black or fuliginous-black; cilia fuliginous. *Forewing* with pale fuliginous or greyish-fuliginous streaks bordering the outer veins, these streaks terminating uniformly at some distance before the exterior margin; similar pale short streaks also extending from within end of the cell. *Hindwing* with a lower-discal series of three, or four, white or ochreous-white spots, which are usually small and short and disposed in a curve at some distance beyond end of the cell; at the anal angle between the lower median and submedian is a contiguous more or less irregular-shaped spot, this latter spot being more or less elongatedly-ocellate with a black centre and of a sullied-white or crimson colour, or is whitish anteriorly and crimson posteriorly; beyond is a submarginal series of five dusky-scaled lunules, which are either dull or bright crimson and sometimes dull ochreous. Underside. *Forewing* duller fuliginous-black; the vein-streaks much paler. *Hindwing* intense black; the discal white spots as on upperside, and with six submarginal pale or bright crimson spots larger and broader than on upperside, the upper spot being placed in the costal interspace; the anal spot also bright crimson. *Thorax* and abdomen above black; front of head, palpi, collar, sides of thorax beneath and abdomen bright crimson; abdomen beneath with black segmental bands; antennæ and legs black.

Female. Upperside duller coloured. *Forewing* olivescient fuliginous-black; the vein-streaks less prominent and duller fuliginous. *Hindwing* olivescient-fuliginous basally, black externally; the discal white spots, positioned as in the male, are similar in shape but somewhat larger and broader; the submarginal lunules also larger, paler and duller coloured. Underside similar to the male.

Expanse, ♂ ♀ 3 to 4 inches.

Wet-season form (Plate 442, fig. 1, ♂, 1a, ♀, 1b, ♂, 1c, ♀).

- Menelaides Ceylonica*, Moore, Lep. of Ceylon, i. p. 151, pl. 57, fig. 2, ♂, 2a, b, *larva* and *pupa* (1881).
- Papilio Diphilus*, var. C. Gray, Catal. Lep. B. M. i. p. 10.

Male. Upperside brighter and darker coloured than in the dry-season form. *Forewing* with the vein-streaks broader and paler. *Hindwing* with the discal series of white spots elongated and extending from outer edge of the cell, the upper one

being generally the smallest or the shortest, these spots thus forming a more or less large discal patch, and in some specimens a small dentated spot is contiguously situated within the end of the cell; the contiguous anal irregular-shaped spot is more elongated. Underside. *Forewing* duller black; the vein-streaks pale fuliginous-grey and broader. *Hindwing* with the discal white spots as on upperside; the six submarginal spots and posterior portion of the anal spot bright crimson.

Female. Upperside. Ground-colour similar to the dry-season form. *Forewing* with the vein-streaks paler. *Hindwing* with the discal white spots as in the male; the submarginal lunules broader and paler. Underside similar to the male.

Expanse, ♂ ♀ 3 to 4 inches.

LARVA.—“Adult $1\frac{1}{4}$ inch long. Stout, cylindrical and tuberculous. Ground-colour velvet brown-black; dorsal line black; four longitudinal rows of fleshy tubercles bright red at the apex and velvety at the base; a similar lateral row of tubercles on anterior segments; on seventh segment a milk-white jagged lacerated band reaching right across the body and terminating at the third row of tubercles; the tubercles on that segment are white with the exception of the third and fourth row; head black; segmental incisions dark purple-brown; legs and abdomen beneath black; stigmata black; retractile tentacula orange. Feeds on *Aristolochia indica*. Habits slow.”

PUPA.—“August 29th; darkish-brown; stout and broad, swollen at the sides; with four pairs of very prominent protuberances on the back of abdomen. Imago emerged September 10th” (Capt. H. L. Chaumette, Lucknow, MS. Notes).

HABITAT.—North Western, Eastern, and Continental India; Ceylon; Burma; Tenasserim; Siam; Malay Peninsula; Nicobars; Java; Formosa; W. China.

HISTORICAL NOTE.—Mr. L. de Nicéville remarks, “the food plant of this butterfly (*Aristolochia*) must have been known to Fabricius in Europe in 1775, when he described the insect, and probably named it after the pabulum of the larva” (J. A. S. Beng. 1900, 257).

DISTRIBUTION AND HABITS.—In North-Western India it is recorded by Mr. P. W. Mackinnon as being “found rarely in the Dehra Dun in April and October” (J. Bombay N. H. S. 1898, 591). Mr. W. Doherty took it “at Ranibagh and Haldwani at the foot of the Hills, Kumaon” (J. A. S. Bengal, 1886, 137). Capt. A. M. Lang says, “Not observed in the North-West Himalayas. It occurs in Oudh, and rare at Umballa” (Ent. Mo. Mag. 1864, 101). Capt. H. L. Chaumette found and reared the larva in Lucknow in 1861, feeding on *Aristolochia indica*, the description of which, from his MS. Notes, is given above. The larvæ were found in August, changed to pupæ on the 29th, and the imago emerging on September 10th. The butterfly is found on the wing in Lucknow from April to October, but is not common. It is fond of flying amongst the orange and lime groves, the thorns of which continually destroy

the delicate tails. Its flight is slow and heavy." "Not a very common species at Saugor, but by no means rare." Major H. B. Hellard took it at Allahabad, N.W. India. We possess specimens of both dry and wet forms from Manpuri, N.W. Provinces, taken by the late Mr. C. Horne, and a female (dry-form) taken at Akote, Central India, in February. Col. C. Swinhoe took it at Dudhi and Shahgunge, Mirzapur, N. W. Prov. in February," and also records it as "plentiful in Karachi in July and August" (P. Z. S. 1884, 512). We possess *both forms* from Karachi, taken in August, and the *dry form* from Kattywar and Sind. Proceeding Southward, Col. Swinhoe found it "common in Mhow, from September to March" (P. Z. S. 1886, 433); also "common everywhere in Bombay and the Dekhan from October to June; varying much in size and markings, some of the males taken in the cold weather at Ahmednuggur being very small and measuring less than three inches in expanse of the wings" (*ib.* P. Z. S. 1885, 145). Mr. J. Davidson and E. H. Aitken "reared the larva in Kanara during the rains. In the Dekhan, where it is much commoner, it feeds on *Aristolochia bracteata*, a feeble plant with bluish-green leaves, that trails on black soil" (J. Bombay N. H. S. 1890, 362). "It is even commoner in the Kanara district than *P. Hector*. As late as January we have seen a mangoe tree in bloom literally alive with them at an early hour in the morning. Both this species and *P. Hector* travel much" (*ib. l.c.* 1896, 577). Mr. G. F. Hampson took it on the Nilgiris at from 1000 to 7000 feet" (J. A. Soc. Beng. 1888, 363). Capt. E. Y. Watson found it "not very common in Madras from March to June" (J. A. S. Beng. 1890, 268). Sir W. Elliot reared the larva, in Madras, on *A. bracteata*, in August. "A few were taken at Sagar and Kathlekan, Mysore, in January" (*ib.* J. Bombay N. H. S. 1890, 9). Mr. H. S. Ferguson records it as common in Travancore, in the low country and the Hills" (*l.c.* 1891, 446). In Ceylon Mr. F. M. Mackwood records it as occurring "all the year round; in low country, and hills up to about 4000 feet elevation. Occasionally a few occur in the highest range" (Lep. Ceyl. i. 151). Dr. N. Manders also found it "an abundant species in Ceylon, especially so in the low country" (J. As. S. Beng. 1899, 221). Proceeding N.-Eastward, Mr W. C. Taylor says it is "very common at Khorda, in Orissa" (List, p. 16). Mr. J. Rothney found it "very common in Barrackpur Park near Calcutta, from March to October" (Ent. Mo. Mag. 1882, 73). Mr. L. de Nicéville says it is "very common in the neighbourhood of Calcutta, where it is commonly called the "rose butterfly," in consequence of its strong scent; the larva feeds on *Aristolochia*" (J. As. Soc. Beng. 1885, 52). We possess both sexes of the *dry-season* form from Calcutta. Col. C. Swinhoe records it from the Khasias (Tr. Ent. Soc. 1893, 313). Mr. J. Wood-Mason took "twenty males and four females at Silcuri, Cachar, in May and August" (J. As. Soc. Beng. 1886, 376). Mr. H. J. Elwes records it as "common in Sikkim up to 2000 or 3000 feet elevation, from April to December"

(Tr. Ent. Soc. 1888, 427). Mr. L. de Nicéville says it is "an insect of the plains, but occurs in the lower valleys of Sikkim throughout the warm months" (Sikkim Gaz. 1894, 171). Mr. W. Rothschild has a male *dry-form* taken in September, and both sexes of the *wet-form* taken in Sikkim, in April and October, by Mr. Müller. Mr. G. C. Dungeon took it at Buxa, in Bhotan. In Burma "it is very abundant, especially near the sandy beds of streams, throughout the year; the females are as plentiful as the males, and frequent the same places" (Col. C. H. E. Adamson, List, 1897, 47). Commander A. Carpenter obtained it "at Sheemagar and Kyouk-Myoung, Upper Burma, in December" (Ann. N. H. 1886, 189). It is very common in the Shan States, but is not found, I think, above 5000 feet" (Dr. N. Manders, Tr. Ent. Soc. 1890, 535). Mr. Ossian Limborg records it from "Moulmein to Meetan, Hatseiga, and from Naththoung to Paboga," Upper Tenasserim (P. Z. S. 1878, 840). Signor L. Fea obtained it at Kokaret and Meetan in May, and at Meteleo, Karen Hills, in August. Mr. H. J. Elwes records "many males and females from Tavoy, Ponseikai, and the Hills" (J. As. S. Beng. 1886, 435). We possess a male of the *dry-form*, taken in Chittagong, in November, and both sexes of the *wet-form* from Burma, showing the white spot within apex of the cell. We also possess two males from Mr. F. de Roepstorff's Collection, labelled "Car Nicobar" and "Pulo Condul," which agree with Ceylon *wet-form* in having the white spot within apex of the cell, and a female, also labelled "Car Nicobar," without the cell spot.

It also is found in Siam; we have it from the Malay Peninsula, Java, and Formosa. It occurs also in W. China.

MENELAIDES CAMORTA (Plate 443, fig. 1, 1a, ♂, 1b, c, ♀).

Papilio Aristolochiæ, var. *Camorta*, Moore, Proc. Zool. Soc. Lond. 1877, p. 592, ♀. Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1881, p. 237; *ib.* 1882, p. 18. Rothschild, Nov. Zool. ii. p. 250 (1895).

IMAGO.—Male. Upperside. Differs from the dry-season form of *Aristolochiæ*, on the hindwing, in having one small short white discal spot, and sometimes two other more or less obsolescent small black-speckled spots, each disposed at the base of the interspace of the medians, and an upward elongation of the red anal spot. Underside. *Hindwing* with three small short white spots disposed in the basal interspace of the medians, and also a small white dentate-spot within apex of the cell, the two outer spots and the cell spot being slightly black-scaled. The anal crimson spot elongated.

Female. Upperside. *Hindwing* with a small white-speckled spot only present, in the basal interspace of the lower medians; the elongated anal spot paler. Underside as in the male, the cell spot less apparent or obsolete.

Expanse, ♂ $3\frac{1}{2}$ to $4\frac{1}{2}$, ♀ $4\frac{1}{2}$ to $4\frac{3}{4}$ inches.

HABITAT.—Camorta, Nancowry, Nicobar Isles.

The type specimen of this butterfly was taken on Camorta Island by Mr. R. Meldola, in April. Others, of both sexes, were since received from Mr. F. de Roepstorff, taken at Camorta and Nancowry.

INDO-MALAYAN SPECIES.—*Menelaides Annæ* (Papilio Annæ, Felder, Wien. Ent. Mon. v. p. 297, ♂ (1861); *id.* Reise Nov. Lep. i. p. 132, pl. 20, fig. c, ♀ (1865). Rothschild, Nov. Zool. ii. p. 243 (1895). Pap. (Men.) Annæ, Semper, Philipp. Tagfalt. p. 271, pl. 46, fig. 2 ♀ (1891). *Habitat.* Mindoro, Philippines.—*Menelaides Phlegon* (Pap. Phlegon, Felder, Verh. Z. B. Ges. Wien. 1864, p. 326, ♀. Pap. (Men.) Phlegon, Semper, *l.c.* p. 271, pl. 46, fig. 3 ♂ (1891). Pap. Annæ *subsp.* Phlegon, Rothschild, *l.c.* p. 243 (1895). *Habitat.* S. W. Mindanao.—*Menelaides Mariæ* (Pap. Mariæ, Semper, Verh. Ver. Nat. Hamburg, iii. p. 115 (1878). Oberthür, Etud. Ent. iv. p. 44 (1879). Rothschild, *l.c.* p. 244 (1895). Pap. (Men.) Mariæ, Semper, *l.c.* p. 270, pl. 46, fig. 5, ♂ (1891). *Habitat.* Bohol; Cebu; Mindanao.—*Menelaides Almæ* (Pap. (Men.) Almæ, Semper, Phil. Tagfalt. p. 270, pl. 46, fig. 6, ♂ (1891). Pap. Mariæ *subsp.* Almæ, Rothschild, *l.c.* p. 244 (1895), *Habitat.* Polillo, Philippines.—*Menelaides Phegeus* (Pap. Phegeus, Hopffer, Stett. Ent. Zeit, 1866, p. 32. Rothschild, *l.c.* p. 244. Pap. (Men.) Phegeus Semper, *l.c.* p. 270, pl. 46, fig. 4, ♂ (1891). *Habitat.* Samar; Panaon; Mindanao.—*Menelaides Atropos* (Pap. Atropos, Staudinger, Iris, 1888, p. 276; *ib.* 1889, p. 11. Rothschild, *l.c.* p. 245. *Habitat.* Palawan.—*Menelaides Schadenbergi* (Pap. (Men.) Schadenbergi, Semper, *l.c.* p. 269, pl. 44, fig. 1 ♂, pl. 45, fig. 5, ♀ (1891). Rothschild, *l.c.* p. 245. *Habitat.* N.W. Luzon; Babuyan.—*Menelaides Micholitzii* (Pap. (Men.) Micholitzii, Semper, *l.c.* p. 269, pl. 44, fig. 2 ♂, pl. 45, fig. 6 ♀ (1891). Pap. Schadenbergi *subsp.* Micholitzii, Rothschild, *l.c.* p. 245. *Habitat.* N. E. Luzon.—*Menelaides Philippus* (Pap. (Men.) Aristolochiæ *var.* Philippus, Semper, *l.c.* p. 169, pl. 44, fig. 7, 8, 9 ♂, pl. 45, fig. 3, 4 ♀, pl. 46, fig. 1 *aber.* ♂ (1891). Pap. Aristolochiæ *subsp.* Philippus, Rothschild, *l.c.* p. 250. *Habitat.* S.E. Islands, Philippines.—*Menelaides Kotzebueus* (Pap. Kotzebuea, Esch. Kotzeb. Reise, iii. p. 202, pl. 1, fig. 2, 2a ♀ (1821). Dewitz, Nov. Acta Acad. N. C. 1882, p. 264, pl. 2, fig. 3, 3a, b. Pap. Arist. *subsp.* Kotzebueus, Rothschild, *l.c.* p. 250 (1895). *Syn.* Pap. Antiphus, Thon, Nat. Schmett. p. 19, pl. 7, fig. 35, 36 (1837). Semper, Phil. Tagf. p. 267, pl. 44, fig. 3, 4 ♂, 5 ♀, pl. 45, fig. 1, 2 ♀ (1891). *Habitat.* N. and W. Philippines. Sulu Islands.—*Menelaides Acutus* (Pap. Acuta, Druce, P. Z. S. 1873, p. 358. P. Antiphus *var.* Acuta, Oberth. Et. Ent. iv. p. 113 (1879). Semper, *l.c.* p. 268 (1891). P. Arist. *subsp.* Acutus, Rothschild, *l.c.* p. 251. Pap. Antiphus *var.* Periphus Oberth. *l.c.* p. 113. P. Antiphus *var.* acuta, *aber.* brevicauda, Staudinger, Iris, 1889, p. 10. *Habitat.* N. Borneo; Palawan.—*Menelaides Antiphus* (Pap. Antiphus, Fabr. Ent.

Syst. iii. 1, p. 10 (1793). Donovan. Ins. Ind. pl. 15, fig. 2 (1800). De Haan, Verh. Nat. Gesch. Ned. p. 49, pl. 8, fig. 2 ♀ (1840). Hagen, Iris, p. 20, pl. 1, fig. 1 (1894). Pap. (Men.) Antiphus, de Nicéville, J. As. Soc. Bengal, 1895, p. 510. Pap. Aristolochia, *subsp.* Antiphus, Rothschild, *l.c.* p. 251. Pap. Theseus, Butler, Catal. Fabr. Lep. B. M. p. 258, *nec* Cramer. *Habitat.* Sumatra; Nias; Java; Borneo.

Genus LOSARIA.

Papilio (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

Papilio (group 2), Rothschild, Nov. Zool. ii. p. 252 (1895).

Male. *Forewing* extremely long and narrow; apex convex, exterior margin of nearly parallel width from the costa throughout its length, posterior margin very short; cell very long and narrow. *Hindwing* short anteriorly, prolonged posteriorly; exterior margin deeply scalloped, and with a lengthened broadly spatulate-tipt tail at end of upper median veinlet; abdominal margin slightly folded over and grooved along the submedian vein, the groove furnished with long fine hairs. *Body* moderately stout; abdomen with prominent large anal valves; posterior tibia slightly incrassated towards the middle, densely clothed with very short fine spiny scales.

TYPE.—L. Coon.

LOSARIA DOUBLEDAYI (Plate 438, fig. 1, 1a, ♂, 1b, ♀).

Papilio Doubledayi, Wallace, Trans. Linn. Soc. Lond. xxv. p. 42 (1865). Moore, Proc. Zool. Soc.

Lond. 1878, p. 840. Oberthür, Etudes Ent. iv. p. 45 (1879). Distant, Rhop. Malayana, p. 336, pl. 33, fig. 4, ♀ (1885). Rothschild, Nov. Zool. ii. p. 253 (1895).

Papilio (*Menelaides*) *Doubledayi*, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 435.

Menelaides Doubledayi, Moore, Journ. Linn. Soc. Lond. Zool. 1886, p. 51.

IMAGO.—Male. Upperside. *Forewing* very long and narrow; fuliginous-black, outer veins bordered with short pale fuliginous-grey streaks, and similar pale streaks extending within the cell from base to the end. *Hindwing* rich dark bluish-black; with a large central vein-divided white or ochreous-white patch, extending across fully the apical half of the cell, within the basal interspaces of the outer veins and between the median and submedian below the cell, the portions between the medians narrow, the upper or costal portion being either broad or narrow, the cell-area traversed by two longitudinal faint blackish lines; the abdominal margin and its fringe of hairs being fuliginous-brown; beyond are three upper-submarginal whitish lunules, the lower being sometimes, and occasionally all three, crimson-tinted, followed by a lower-submarginal bright crimson short lunule in the middle median interspace, this latter being sometimes absent; a marginal spot at end of the middle

median, and a recurved lunule from the lower anal angle. Underside. *Forewing* paler; the vein streaks also paler. *Hindwing* as on upperside. *Thorax* above and below black; palpi black; frontal tuft, collar, sides of thorax beneath, and abdomen crimson; abdomen above and beneath with black segmental bands and lateral spots; antennæ and legs black.

Female. Upperside duller coloured. *Forewing* shorter and broader; outer vein streaks somewhat narrower. *Hindwing* with the central white patch somewhat smaller, the two short outer-median portions more or less obsolescent; outer lunules paler, the lower anal lunule partly white. Underside similar to the upper. *Body* pale red.

Expanse, ♂ 5 to $5\frac{1}{2}$, ♀ $4\frac{1}{2}$ inches.

HABITAT.—Burma; Tenasserim; Malay Peninsula.

DISTRIBUTION.—“Not uncommon near Rangoon and Moulmein in October and November. Taken also in June. Males much more common than the female” (Col. C. H. E. Adamson, List, p. 47). Mr. Ossian Limborg obtained it “on the road from Moulmein to Meetan, Upper Tenasserim” (P. Z. S. 1878, 840). Signor L. Fea took it at Moolayet in March. Col. C. T. Bingham found it at Thoungyen in December, on the Donat Range in January, and at Rangoon from August to December. Mr. H. J. Elwes records it from “Tavoy, Tenasserim” (J. As. Soc. Bengal, 1886, 435). It also occurs at Perak, Malay Peninsula.

LOSARIA CACHARENSIS (Plate 439, fig. 1, 1a, ♂, 1b, ♀).

Papilio Cacharensis, Butler, Ann. and Mag. Nat. Hist. 1885, p. 344.

Papilio Doubledayi, Butler, Trans. Ent. Soc. Lond. 1879, p. 8.

Papilio (Menelaides) Doubledayi, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 377.

Papilio Doubledayi, subsp. *Cacharensis*, Rothschild, Nov. Zool. ii. p. 253 (1895).

IMAGO.—Smaller than *Doubledayi*. Male. Upperside. *Forewing* shorter, paler; the black cell-lines more slender, and the black vein-streaks narrower. *Hindwing* with the central white patch composed of smaller, shorter and wider-separated portions, the cell portion being restricted to about one-third the apical area; the three upper submarginal lunules smaller, the lower or fourth submarginal lunule, the marginal spot and the recurved lunule at the lower anal angle, either pale ochreous or crimson. Front of head, collar, sides of thorax beneath, and abdomen pale ochreous or pale crimson.

Female. Upperside paler. *Forewing* with the cell and vein streaks as in male. *Hindwing* with the central white patch composed of wider-separated portions, the cell portion being restricted to a short streak; the outer lunules paler, the recurved lower anal lunule partly white. Underside as in the upper.

HABITAT.—Cachar; Assam.

DISTRIBUTION.—Mr. J. Wood-Mason records “five males taken at Silcuri, Irangmara, and Doorband, Cachar, from May to July. It has a musk-scented body” (J. As. Soc. Bengal, 1886, 377). Mr. W. Rothschild has it from Dullabcherra, Cachar.

LOSARIA SAMBILANGA.

Papilio Doubledayi, var. *Sambilanga*, Doherty, Journ. As. Soc. Bengal, 1886, p. 263.

Papilio Doubledayi, subsp. *Sambilanga*, Rothschild, Nov. Zool. ii. p. 254 (1895).

IMAGO.—“Intermediate between *Doubledayi* and *Rhodifer*. The tail is black in *Doubledayi*. Of the discal semicircle of whitish spots on the hindwing, that on the abdominal margin is very short, those between the middle median and the radial are generally absent above and quite rudimentary below. The anal orange spot is large, the marginal one at the end of the middle median is joined with the submarginal one between the two upper medians, both above and below, very much as in *Rhodifer*. The female is similar, but the wings are wider and the tails much shorter and broader.”

HABITAT.—Great Nicobar Island.

DISTRIBUTION.—Mr. Doherty states that it is “rather common on Great Nicobar Island” (*l.c.*). We have not seen specimens of this species.

LOSARIA RHODIFER (Plate 440, fig. 1, ♂, 1a, ♀).

Papilio Rhodifer, Butler, Entom. Monthly Mag. xiii. p. 57 (1876). Moore, Proc. Zool. Soc. Lond. 1877, p. 592. Oberthür, Etudes Ent. iv. p. 45 (1879). Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 240; de Nicéville, *ib.* 1881, p. 253. Staudinger, Exot. Schmett. i. p. 6, fig. 3, ♂ (1884). Haase, Untersuch. üb. Mim. p. 26, pl. 6, fig. 40 (1893). Rothschild, Nov. Zool. ii. p. 254 (1895).

IMAGO.—Male. Upperside. *Forewing* long and narrow; fuliginous-black, with pale fuliginous-grey short broad streaks bordering the outer veins and longitudinal streaks within the cell. *Hindwing* black; abdominal margin brown; with a central white vein-divided patch extending across half the cell to near its apex, and within the basal interspaces of the outer veins to the submedian interspace below the cell, the portion in the lower median interspace being small and narrow, that in the middle median minute or absent, very rarely one is also present in the upper median interspace; beyond are three submarginal whitish lunules, the upper one being much the smallest or obsolescent, and then two lower marginal larger lobed-lunules extending upward from the inner angles, the two latter being pale crimson and slightly speckled anteriorly with white and black scales, and posteriorly with pale

crimson scales; tip of tail with a large paler crimson spot. Underside. *Forewing* paler; vein streaks also paler. *Hindwing* similar to the upperside. *Thorax* black; abdomen pale crimson, with black basal bands and lateral spots; front of head, palpi, collar, and sides of thorax beneath pale crimson; antennæ and legs black.

Female. Upperside. *Forewing* broader than in male; pale streaks similar. *Hindwing* with the central white patch as in the male; the three upper submarginal lunules somewhat larger, the lower partly speckled with crimson scales, these scales also extending to the outer angle, the two lower marginal lobed-lunules and the tip of tail bright crimson. Underside similar to the upperside, except that there is a very small white-speckled spot also present in the costal interspace.

Expanse, ♂ 5 to $5\frac{1}{4}$, ♀ $4\frac{3}{4}$ to 5 inches.

HABITAT.—Andaman Isles.

DISTRIBUTION.—Mr. F. A. Roepstorff obtained it at Port Blair, S. Andamans.

INDO-MALAYAN SPECIES.—*Losaria Coon* (Papilio Coon, Fabricius, Ent. Syst. iii. 1, p. 10 (1793). Donovan, Ins. China, pl. 24, fig. 1 (1798). Zinken-Sommer, Nova Acta Ac. N. C. (1832), p. 146, pl. 14, fig. 3. Lucas, Lep. Exot. p. 11, pl. 6, fig. 2 (1835). Boisd. Spec. Gén. Lep. i. p. 201 (1836). Blanchard, Hist. Nat. Ins. iii. p. 421, pl. 2, fig. 1 (1840). Chenu's Encyc. H. N. Pap. pl. 14, fig. 1 (1851). Rothschild, Nov. Zool. ii. p. 252 (1895). Syn. Pap. Hypenor, Godart, Enc. Meth. ix. p. 65 (1819). Achillides Hypenor, Hübner. Samm. Exot. Schmett. iii. pl. 23, figs. 1, 2 (1834-41). *Habitat.* Java.—*Losaria Patiana* (Pap. Coon *aber.* Patianus, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 309. *Habitat.* N. Java.—*Losaria Palembangana* (Pap. Palembanganus, Rothschild, Nov. Zool. iii. p. 421 (1896). *Habitat.* Sumatra.—*Losaria Deliana* (Pap. Doubledayi, *var.* Delianus, Fruhstorfer, Ent. Nach. 1895, p. 196. Rothschild, *l.c.* p. 254. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 511. *Habitat.* Sumatra.

Genus BALIGNINA. *Forewing* elongated, triangular; costa arched, apex convex, exterior margin very oblique, posterior margin short. *Hindwing* short, not prolonged posteriorly, exterior margin scalloped, with a long basally attenuated spatular-tipt tail; abdominal fold when opened displaying an elongated patch of white scales extending from the base to anal angle, and long erectile white hairs along edge of the submedian vein. Abdomen with prominent anal valves; hind tibia incrassated towards the middle. *Type.* B. Neptuna.—*Balignina Neptuna* (Papilio Neptunus, Guérin, Rev. Zool. 1840, p. 43; *id.* Delessert's Voy. Ind. ii. p. 69 (1843). Wallace, Tr. Linn. Soc. 1865, p. 42. Distant, Rhop. Malay. p. 335, pl. 33, fig. 5 ♂, 6 ♀ (1885). Rothschild, Nov. Zool. ii. p. 255 (1895). Syn. P. Saturnus, Guérin, Deless. *l.c.* pl. 19 (1843). Pap. Thetys, Guénee, Lep. Mus. Genève, p. 10, pl. 1, fig. 5 (1878). *Habitat.* Malay Peninsula; Borneo.—*Balignina Sumatrana* (Pap. Neptunus, *var.* Sumatranus, Hagen, Iris, 1894, p. 21. Rothschild, *l.c.* p. 225. Pap.

(Men.) Sumatranus, de Nicéville, J. As. Soc. Bengal, 1895, p. 511. *Habitat.* Sumatra.—*Balignina Fehri* (Pap. Neptunus, var. Fehri, Honrath, Berl. Ent. Zeit. 1891, p. 432. Rothschild, l.c. p. 255. *Habitat.* Nias.

Genus SAINIA.

Sainia, Moore, Proc. Zool. Soc. Lond. 1882, p. 260.

Papilio (part), Doubleday and Hewitson.

Papilio (sect. 65, subsect. D, part), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 324, 372.

Papilio (group xi.), Rothschild, Nov. Zool. ii. p. 331 (1895).

IMAGO.—Male. *Forewing* elongated, triangular; costa much arched, apex rounded, exterior margin very oblique and slightly concave in the middle, uneven, posterior margin short. *Hindwing* moderately short anteriorly, somewhat prolonged posteriorly, exterior margin slightly convex and scalloped anteriorly, somewhat truncate and less scalloped posteriorly, anal angle lobed; basal area hairy; abdominal margin with a narrow grooved-fold along submedian vein; cell long, broad at the end; costal vein and subcostal veinlets long. Female similar in shape to the male. Both sexes tailless. *Body* short and slender; antennæ slender; anal valves narrow, obtusely pointed at the tip.

LARVA.—Head small; anterior segments increasing in size to the fourth and thence of same thickness to near end; on second and last segment is a pair of short blunt tubercles; fourth segment surmounted by a rough transverse ridge.

PUPA.—Unknown.

TYPE.—S. *Protenor*.

SAINIA PROTENOR (Plate 444, fig. 1, larva, 1a, b, ♂, 1c, d, ♀).

Papilio Protenor, Cramer, Pap. Exot. i. p. 77, pl. 49, fig. A, B, ♂ (1775). Goeze, Ent. Beytr. iii. 1, p. 43 (1779). Fabricius, Spec. Ins. ii. p. 7 (1781); Mant. Ins. ii. p. 4 (1787); Ent. Syst. iii. 1, p. 13 (1793). Jablonsky and Herbst, Nat. Schmett. ii. p. 5, pl. 7, fig. 1, 2 (1784). Esper, Ausl. Schmett. p. 133, pl. 33, fig. 2 (1792). Godart, Encyc. Méth. ix. p. 30 (1819). Boisduval, Spec. Gén. Lep. i. p. 198 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 25 (1840). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Hutton, Trans. Ent. Soc. Lond. 1847, p. 49. Gray, Catal. Lep. B. M. i. p. 14 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 98 (1857); *id.* Proc. Zool. Soc. Lond. 1865, pp. 487, 756. Lang, Ent. Mo. Mag. 1864, p. 101. Felder, Verh. Z. B. Ges. Wien. 1864, p. 324. Oberthür, Etud. Ent. iv. p. 37 (1879); *id.* xvii. p. 2 (1893). Staudinger, Exot. Schmett. i. p. 9, pl. 5, ♂ (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 428. Leech, Butt. of China, ii. p. 545 (1893). Rothschild, Nov. Zool. ii. p. 331 (1895).

Iliades Protenor, Hübner, Verz. bek. Schmett. p. 89 (1816).

Sainia Protenor, Moore, Proc. Zool. Soc. Lond. 1882, p. 260. Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

Papilio (Sainia) Protenor, Doherty, Journ. As. Soc. Bengal, 1886, p. 137. Mackinnon and de Nicéville, Journ. Bombay, N. H. Soc. 1898, p. 592, pl. W, fig. 23, larva.

Papilio Lamedon, Fabricius, Ent. Syst. iii. 1, p. 12 (1793). Donovan, Ins. of China, pl. 25, ♀ (1798).

IMAGO.—Male. *Forewing* fuliginous or greyish-black, with a black or blue-black longitudinal streak between the veins and similar streaks within the cell; cilia alternately edged with white. *Hindwing* blue-black, with a broad longitudinal greyish-white scaled streak below the costal vein; outer discal area more or less irrorated with scattered minute blue scales; an ocellated crimson spot with black centre at the anal angle, the crimson being outwardly edged with bluish-grey scales; cilia alternately edged with white. Underside. *Forewing* greyish-fuliginous, the black streaks prominent. *Hindwing* black; with a large, duller crimson violet-scaled ocellated anal patch which extends irregularly inward to or near the middle median, and is posteriorly coalescent with a large lower anal ocellus with black centre; beyond, are either two upper marginal dull crimson incomplete ocelli speckled with bluish-white scales, or a series of five lunules, the three lower being placed more submarginally inward and decreasing in size posteriorly; a few minute blue scales are scattered inwardly contiguous to the latter lunules.

Female. Upperside. Both wings paler. *Hindwing* with the upper discal area or the entire wing to the base irrorated with minute bluish-grey scales; a large anal dull crimson violet-speckled irregular-shaped ocellated patch, and lower anal ocellus, very similar to that on the underside of the male; a small crimson submarginal lunule is also sometimes present between the lower and middle median veinlet. Underside paler. *Hindwing* with similar markings to the male; the anal irregular patch and lower anal ocellus being larger and coalescent, the former sometimes extending outward to near the upper median, and is also occasionally followed by a slender lunule beyond the upper median veinlet. *Head*, palpi, thorax, and abdomen, legs and antennæ black; collar and vertex with a few white-tipt scales.

Expanse, ♂ $3\frac{1}{2}$ to 5, ♀ $4\frac{1}{2}$ to 5 inches.

LARVA.—Head small, anterior segments increasing in size to the fourth and thence of nearly same thickness to near the end; second and last segment each with a pair of short blunt tubercles; colour green, with a yellow collar, and brown lichenoid markings.

PUPA.—Unknown.

HABITAT.—W. and E. Himalayas; Assam; Khasia Hills; Burma; C. and W. China; Tonkin; Hong Kong.

DISTRIBUTION AND HABITS.—“This is by no means an uncommon species in the warm glens of the Masuri Hills, N.W. Himalaya, and it is common in the Dhun. Its flight is somewhat heavy and unsteady” (Capt. T. Hutton, Tr. Ent. Soc. 1847, 49). “A considerable number seen together, in the Masuri Hills, floating and flapping their wings lazily, and then settling on the blossoms in waste marshy ground overgrown with *Compositæ* (thistles). I have also seen a number congregated with *Pap.*

Polyctor on the damp sandy margins of streams in the Hills—on these occasions, if disturbed, they disperse, only to collect in groups again. Elevation 4000 to 7000 feet” (Capt. A. M. Lang, Ent. Mo. Mag. 1864, 101). Mr. P. W. Mackinnon records it as “very common, in the low valleys about Masuri, in company with *Pap. Polyctor*, from March to October. Specimens of the *spring brood*, which fly in March and April, are very small as compared with those of the *rainy season*. The larva feeds on *Zanthoxylum alatum* (Order Rutaceæ); it is green, with a yellow collar, and brown lichen-like markings. Some pupæ are coloured like rough bark, others are uniformly green” (Journ. Bombay N. H. Soc. 1898, 592). Mr. W. Doherty found it in “Kumaon generally, from 2000 to 6000 feet elevation, though not very common” (Journ. As. Soc. Bengal, 1886, 137). Mr. H. J. Elwes says, “Mr. O. Möller records this species as occurring in Sikkim from 2000 to 3000 feet, from April until October, but it occurs at much higher elevations in the N.W. Himalaya, and in the Khasias I have seen it up to at least 6000 feet. It is not, however, so common in Sikkim as in some other parts of the Himalaya, and the female is decidedly rare. I have never taken it myself in Sikkim” (Tr. Ent. Soc. 1888, 428). Mr. L. de Nicéville records it as “somewhat rare in Sikkim, and occurs from 2000 to 5000 feet elevation throughout the warm months” (Sikkim Gazetteer, 1894, 172). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 312). Col. C. H. E. Adamson took “two specimens at Tsinbo, north of Bhamo, Burma, in May” (List, 1897, 46). We possess specimens from Simla, N.W. Himalaya, Nepal, Sikkim, and Looshai. The British Museum has examples from Kumaon; taken in May by Col. J. C. Pilcher; Nepal; Bhotan, taken in August by Mr. G. C. Dudgeon; Sibsagar, Assam, and the Khasia Hills. It is also recorded from Central and Western China, Tonkin, and Hong Kong.

Of our illustrations on Plate 444, fig. 1 represents the larva—copied from Mr. Mackinnon’s drawing; fig. 1a and 1d, from a Nepal male and female; fig. 1b and 1c, male and female from Sikkim.

CHINA AND JAPAN SPECIES.—*Sainia Formosana* (Pap. Protenor subsp. *Formosana*, Rothschild, Nov. Zool. v. p. 602 (1898). *Habitat*. Formosa.—*Sainia Demetrius* (Pap. Demetrius, Cramer, Pap. Exot. iv. p. 196, pl. 385, fig. E, F (1782). Jablonsky and Herbst, Nat. Schmett. ii. pp. 223, 289, pl. 20, fig. 1 (1784). Esper, Ausl. Schmett. p. 128, pl. 32, fig. 2 (1792). Boisduval, Spec. Gén. Lep. i. p. 199 (1836). De Haan, Verh. Nat. Gesch. Ned. p. 25, pl. 6, fig. 1 ♂, 2 ♀ (1840). Pryer, Rhop. Nippon, p. 4, pl. 3, fig. 1 (1886). Leech, Butt. China and Japan, ii. p. 546 (1893). Rothschild, Nov. Zool. ii. p. 332 (1895). *Syn.* Pap. Carpenteri, Butler, Ann. Nat. Hist. 1882, p. 318. *Habitat*. Japan; C. and E. China, Loo-Choo Islands.—*Sainia Macilenta* (Pap. Macilentus, Janson, Cist. Ent. ii. p. 158, pl. 5, fig. 1 (1877). Pryer, Rhop. Nipon. p. 4, pl. 3, fig. 2, ♀ (1886). Leech, *l.c.* p. 547 (1893). *Syn.* Pap.

Scævola, Oberthür, Etud. Ent. iv. p. 37, pl. 6, fig. 1 (1879). *Pap. tractipennis*, Butler, Ann. Nat. Hist. 1881, p. 139. *Habitat.* Japan.

Genus PANOSMIOPSIS.

Papilio, subgen. *Panosmiopsis*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374.

Papilio (part), Doubleday and Hewitson.

Papilio (sect. 65, subsect. D, part), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 324, 372.

Papilio (group xii.), Rothschild, Nov. Zool. ii. p. 333 (1895).

IMAGO.—Male. *Forewing* elongated, triangular, narrower than in *Sainia*, posterior margin shorter. *Hindwing* shorter anteriorly, more prolonged posteriorly, exterior margin less convex; cell more pointed at the apex; tailless. A “sexual mark,” composed of a large impressed-patch of scales, is present on the underside of the hindwing, placed between the radial and lower subcostal veinlet.

Female. *Forewing* similar to the male. *Hindwing* more prolonged, more deeply scalloped, and with a broad short tail.

LARVA AND PUPA.—Unknown.

TYPE.—P. *Rhetenor*.

PANOSMIOPSIS RHETENOR (Plate 445, fig. 1, 1a, ♂, 1b, ♀).

Papilio Rhetenor, Westwood, Arcana Entom. i. p. 59, pl. 16, fig. 1, 1a, ♂ (1842). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Kollar, in Hügel's Reise Kaschmir, iv. 2, p. 403 (1844). Gray, Catal. Lep. B. M. i. p. 15 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 98 (1857); *id.* Proc. Zool. Soc. Lond. 1865, p. 756. Felder, Verh. Z. B. Ges. Wien. 1864, p. 324. Oberthür, Etud. Ent. iv. p. 37 (1879). Wood-Mason, Ann. Nat. Hist. 1882, p. 104, ♂ ♀. Staudinger, Exot. Schmett. i. p. 9 (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 428, ♂ ♀. Manders, *id.* 1890, p. 535. Leech, Butt. of China, ii. p. 549 (1893). Haase, Untersuch. üb. Mim. p. 53, pl. 5, fig. 33, ♀, 34, ♂ (1893). Rothschild, Nov. Zool. ii. p. 333 (1895).

Papilio (Panosmiopsis) Rhetenor, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 374. de Nicéville, Sikkim Gaz. 1894, p. 171, ♂ ♀.

Sainia Rhetenor, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

Papilio Icarius, Westwood, Cabinet of Orient. Entom. p. 5, pl. 2, ♀ (1848).

Papilio Alcmenor, Felder, Verh. Z. B. Ges. Wien. 1864, p. 324; *id.* Reise Novara, Lep. i. p. 129, pl. 20, fig. d, ♂ (1865). Haase, Untersuch. üb. Mim. p. 54, fig. 6, ♀ (1893).

IMAGO.—Male. Upperside. *Forewing* rich bluish-grey black, darkest basally; with a blue-black longitudinal streak between the veins and similar streaks within the cell; the intervening pale longitudinal streaks between the lower median and posterior angle are, in most specimens, either sparsely speckled with greyish-white scales, or densely speckled and prominent; a more or less apparent crimson-scaled streak at base of the cell, this streak ascending narrowly along base of the subcostal,

or broadly across the cell to below base of the median vein, in some a few only of these crimson scales are visible; cilia alternately edged with white. *Hindwing* rich blue-black, or olivescence-black; the upper discal area more or less sparsely irrorated with minute blue scales; with a more or less complete irregular-shaped white ocellus centred with a round black spot at the anal angle, this ocellus is variable in size, or rarely almost obsolescent, it is generally speckled anteriorly with crimson scales and occasionally posteriorly with black scales, and in some specimens this ocellus is followed in the lower median interspaces by a single submarginal lunule or an opposed pair (upper and lower) of white lunules, these latter sometimes being joined and then form a ring; cilia alternately edged with white. Underside. *Forewing* paler; with a crimson patch at base of the cell and costa. *Hindwing* black; with a "sexual mark" composed of a discal *impressed-patch* of duller scales situated between the radial and lower subcostal veinlet; between the costal vein and the lower subcostal are two outer clusters of blue scales; the base and a band along abdominal border from the submedian to the middle median crimson, intersected by black veins, the latter portion speckled with white scales, the median interspace bearing three black spots, the lowest sometimes posteriorly with a white tip, two much smaller black spots, or occasionally one only, above the anal angle; beyond, in the upper median interspace is generally a small submarginal crimson lunate-spot, or a well-formed lunule or two opposed lunate spots, and, more rarely, also two similar small spots in the lower subcostal interspace.

Female. Upperside paler. *Forewing* with a crimson streak along upper base of the cell. *Hindwing* with a broad short spatular tail; a broad white vein-intersected discal patch extending from within the cell to above the lower subcostal and to the middle median, this patch being anteriorly more or less edged with black scales; below is a large irregular-shaped crimson anal ocellus speckled posteriorly with white scales and centred with a black spot, followed by three inner-submarginal crimson lunules varying in size, and sometimes also an upper small spot, and then by a marginal corresponding series of broad crimson lunules, the two lowest of which are much the largest and irregular in shape. Underside paler. *Forewing* with the base of the cell and costa crimson. *Hindwing* with the crimson base and abdominal border similar to the male, the latter being more broken and irregular, and the lower black spot larger; the black spot in the next or upper median interspace generally larger, and either entirely or partially encompassed by the crimson border, the two upper pair of crimson lunules being small. *Head*, thorax and abdomen above black; front of thorax and vertex white spotted; body beneath fuliginous-black; antennæ and legs black.

Expanse, ♂ $4\frac{1}{2}$ to $5\frac{1}{4}$, ♀ $4\frac{1}{2}$ to $5\frac{1}{2}$ inches.

LARVA AND PUPA.—Unknown.





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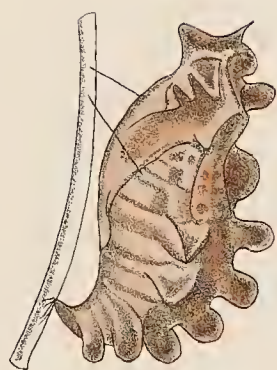






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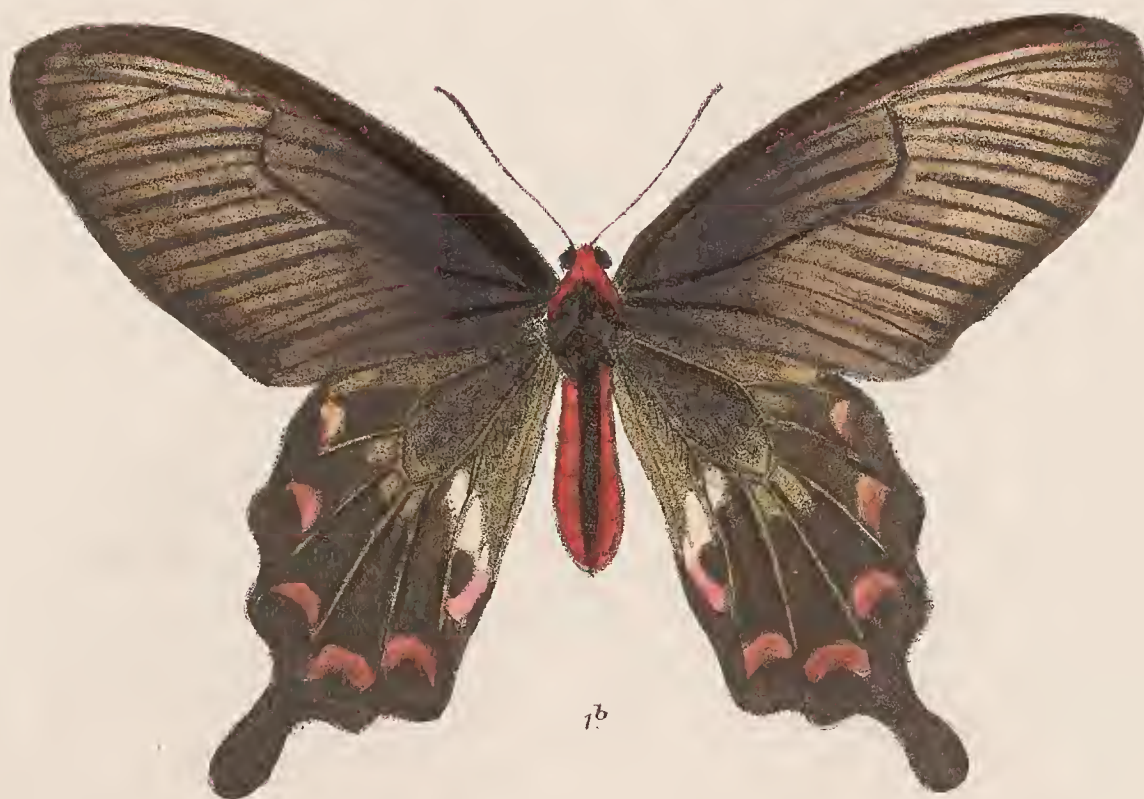
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1^a



1^c



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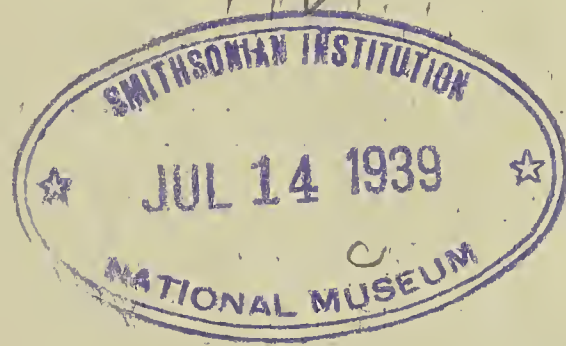
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HABITAT.—Nepal; Sikkim; Bhotan; Assam; Cachar; Khasia Hills; Burma; Shan States; C. and W. China.

DISTRIBUTION.—A female from Nepal, from Gen. G. Ramsay's collection is in our possession, and another in the British Museum. Mr. H. J. Elwes records it from Sikkim, "males being found not uncommonly in the lower valleys, and up to 5000 or 6000 feet, from April to October. The female is rare" (Tr. Ent. Soc. 1888, 429). Mr. L. de Nicéville says, "both sexes are rare in Sikkim, the female especially so. It occurs from April to October, and from the level of the Terai up to 6000 feet" (Sikkim Gaz. 1894, 171). Mr. G. C. Dudgeon took males in Bhotan, in July. Capt. E. Y. Watson obtained it in Assam. Mr. J. Wood-Mason records "two females, captured on Nemotha Peak, Cachar, in September, which were flying in company with *Pap. Dasarada*" (Journ. As. Soc. Bengal, 1886, 374). Col. C. Swinhoe received "a number of both sexes from the Khasia Hills" (Tr. Ent. Soc. 1893, 312). A male, labelled "Barrackpur," near Calcutta, taken by the late Gen. Hearsey, is in the British Museum. Col. C. H. E. Adamson obtained both sexes in the Arakan Hills, in April, and males in the Taoo plateau, Upper Tenasserim, in March. Both sexes have also been taken at Moolai, Upper Tenasserim. Mr. L. de Nicéville records "males only, taken by Mr. T. A. Hauxwell in the Daunat Range, Upper Tenasserim, in February" (Journ. Bombay N. H. S. 1899, 335). Capt. Longe, R.E., obtained "a single male at 2000 feet, on the Manipur River, in February, and Dr. Graves captured a male at 5000 feet during the rains" (Journ. Bombay N. H. S. 1897, 671). Dr. N. Manders records it as "apparently an uncommon species in the Shan States, as I have only taken it at Fort Stedman in October" (Tr. Ent. Soc. 1890, 535).

CHINESE SPECIES.—*Panosmiopsis Elwesi* (Papilio Elwesi, Leech, Trans. Ent. Soc. Lond. 1889, p. 113, pl. 7, fig. 1, ♂; *ib.* Butt. of China, ii. p. 550 (1893). Watson, Entom. News, p. 279, pl. 12, ♀ (1893). Rothschild, Nov. Zool. ii. p. 335 (1895). *Habitat.* C. China.

Genus ILIADES.

Iliades, Hübner, Verz. bek. Schmett. p. 88 (1816). Moore, Lep. of Ceylon, i. p. 147 (1881).

Papilio (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

Papilio (sect. 65, subsect. A, B, C), Felder, Verh. Z. B. Ges. Wien. pp. 323, 371, 372 (1864).

Papilio (group x.), Rothschild, Nov. Zool. ii. p. 312 (1895).

IMAGO.—Wings large. *Forewing* elongatedly-triangular; costa much arched, exterior margin very oblique, posterior margin short; cell long and broad; first subcostal branch emitted at one-third and second at one-fifth before end of the cell, third branch from its end, fifth at one-third from below the fourth; discocellulars of equal length, upper slightly oblique, radial from their angle; median branches at

nearly equal distances apart; a transverse short veinlet connecting the median and submedian vein near the base, and a short basal veinlet curving from below the submedian. *Hindwing* broad; exterior margin convex and scalloped; cell extending to half the wing; first subcostal branch at one-half before end of the cell; upper discocellular oblique, lower bent inward, radial from their angle; lower median veinlet at one-half before end of the cell; submedian vein much curved in the middle. *Body* stout; abdomen moderately short; hind tibia slender, with rows of short fine spines; antennæ with a slender club. Sexes dissimilar; inodorous.

Female. Dimorphic in the shape of the hindwing, which is either tailless, or with a spatulate tail at end of the upper median veinlet.

LARVA.—Elongated; anterior segments scutellated; the 3rd, 4th and 5th segment thickened; head attenuated; an ocellated spot on each side of the 4th segment, and a slight fleshy tubercle on the anal segment.

PUPA.—Thick; curved backwards and prolonged at the apex; head obtusely bifid; thorax broad, somewhat dorsally convex and pointed in front; abdominal segments very slightly tuberculate dorsally; wing-cases laterally dilated and angular in the middle.

TYPE.—I. Memnon.

ILIADES AGENOR (Plates 446, 447, 448, 449).

- Papilio Agenor*, Linnæus, Syst. Nat. ed. x. p. 460, ♀ (1758); *id.* Mus. Lud. Ulr. p. 194, ♀ (1764); *id.* Syst. Nat. ed. xii. p. 747, ♀ (1767). Clerck, Icones Ins. i. pl. 15, *upper* fig. ♀ (1759). Houttuyn, Nat. Hist. i. 2, pl. 87, fig. 2, ♂ (1767). Müller, Naturs. v. 1, p. 570, pl. 17, fig. 2, ♂ (1774). Fabricius, Syst. Ent. p. 446, ♀ (1775). Cramer, Pap. Exot. i. p. 52, pl. 32, fig. A, B, ♀ (1775). Jablonsky, Nat. Schmett. ii. p. 20, pl. 8, fig. 3, ♀ (1784). Esper, Ausl. Schmett. pl. 8, fig. 1, ♂ (1785), *ib.* pl. 26, fig. 1, ♀ (1792). Donovan, Ins. China, pl. 24, fig. 2, ♀ (1798). Distant, Rhop. Malay. p. 339, pl. 29, fig. 1, ♀ (1885).
- Iliades Agenor*, Hübner, Verz. bek. Schmett. p. 89, ♀ (1816). Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 312, ♂ ♀.
- Papilio Agenor*, Aurivillius, Kongl. Sv. Vet. Acad. Handl. xix. 5, p. 18, ♂ ♀ (1882). Staudinger, Exot. Schmett. i. p. 8, ♂ ♀ (1884).
- Papilio (Iliades) Agenor*, de Nicéville, Sikkim Gazetteer, 1894, p. 172, ♂ ♀.
- Papilio Memnon Agenor*, Rothschild, Nov. Zool. ii. p. 316, ♂ ♀ (1895).
- Papilio Androgeos*, Cramer, Pap. Exot. i. p. 142, pl. 91, fig. A, B, ♂ (1776). Moore, Proc. Zool. Soc. 1865, p. 757, ♂ ♀; *id.* 1878, p. 84, ♂ ♀. Wallace, Trans. Linn. Soc. Lond. 1865, p. 47, ♂ ♀. de Nicéville, Journ. As. Soc. Bengal, 1881, p. 53. Elwes, Trans. Ent. Soc. Lond. 1888, p. 428.
- Papilio (Iliades) Androgeos*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 373.
- Papilio Protenor*, Esper, Ausl. Schmett. p. 120, pl. 29, fig. 2, ♂ (1792).
- Papilio Alcanor*, Cramer, Pap. Exot. ii. p. 107, pl. 166, fig. A, ♀ (1779). Esper, Aus. Sch. p. 134, pl. 34, fig. 2, ♀ (1795).
- Achillides Alcanor*, Hübner, Verz. bek. Schmett. p. 85 (1816).

- Papilio Achates*, Cramer, *l.c.*, ii. p. 130, pl. 182, fig. A, B, ♀ (1779). Esper, *l.c.* p. 116, pl. 28, fig. 1, ♀ (1792). Distant, *Rhop. Malay.* p. 342, pl. 28, fig. 3, 4, 5, ♂ ♀ (1885), *nec* Sulzer.
- Iliades Achates*, Moore, *Journ. Linn. Soc. Lond. Zool.* 1886, p. 50, ♂ ♀.
- Papilio Alphenor*, Fabricius, *Spec. Ins.* ii. p. 4, ♀ (1781). Jablonsky, *Nat. Schmett.* ii. p. 205, pl. 10, fig. 1, ♀ (1784), *nec* Cramer.
- Iliades Mestor*, Hübner, *Verz. bek. Schmett.* p. 89, ♂ (1816).
- Papilio Mestor*, Butler, *Trans. Linn. Soc. Lond. Zool.* 1877, p. 553, ♂ ♀. Distant, *Rhop. Malay.* p. 341, pl. 28, fig. 2, ♂, fig. 7, ♀ (1885).
- Papilio Esperii*, Butler, *l.c.* p. 553, pl. 68, fig. 7, ♀ (1877). Distant, *Rhop. Malay.* p. 341, pl. 28, fig. 1, ♂, fig. 6, ♀ (1885). Holland, *Tr. Amer. Ent. Soc.* 1887, p. 122.
- Papilio Phoenix*, Distant, *l.c.* p. 340, pl. 27, B, fig. 7, ♀ (1885).
- Papilio Cilix*, Distant, *l.c.* p. 340, pl. 29, fig. 4, ♂, 5, ♀ (1885).
- Papilio Androgeos* var. *Depelchini*, Robbe, *Ann. Soc. Ent. Belg.* p. 125 (1892), ♂.
- Papilio Memnon Agenor* aber. *Depelchini*, Rothschild, *l.c.* p. 319, ♂ ♀.
- Papilio Memnon Agenor* aber. *primigenius*, Rothschild, *l.c.* p. 319, ♂ (1895).
- Papilio Memnon Agenor* aber. *Butlerianus*, et *Distantianus*, Rothschild, *Nov. Zool.* ii. p. 320, ♀ (1895).

Form 1 (Plate 446, fig. 1, ♂, 1a, b, ♀).

- Papilio Androgeos* var. *Depelchini*, Robbe, *Ann. Soc. Ent. Belg.* 1892, p. 125, ♂.
- Pap. Mem. Agenor* aber. *Depelchini*, Rothschild, *Nov. Zool.* ii. p. 319, ♂ ♀ (1895).

Male. Upperside. *Forewing* bluish-black, with slightly-defined dark greyish-blue cell and vein-streaks, the latter from the upper median very sparsely outwardly-speckled with greyish-white scales; a red basal cell streak in type specimen. *Hindwing* with the exterior margin acutely scalloped, the angle at end of upper median produced into a short-pointed tooth; colour blue-black, with a dark olivescient gloss; costal border purpurescent tinged; a very few bluish-grey scales present, and these are widely and most irregularly scattered.

Underside. *Forewing* bluish-black; cell and vein-streaks prominent and bluish-grey; base of cell scarlet. *Hindwing* deep black; edges of the veins and bordering of slightly-defined outer-marginal spots beyond the middle median veinlet greyish-black; basal intersected-patch scarlet; anal black spot and the two spots in adjoining median interspace scarlet-bordered, the next marginal spot has also a scarlet upper border.

Female. Upperside. *Forewing* black, basal area darkest; base of cell and a small streak below it scarlet; cell and vein-streaks uniformly olivescient-fuliginous. *Hindwing* with pointed tooth at end of the upper median, but not always developed; dark olivescient greyish-black, the base and disc with a bronzy metallic gloss; the discal area very sparsely sprinkled with a few blue scales; lower marginal blackish spots of the underside slightly apparent; anal black spot partly red-bordered. Underside. *Forewing* much paler; cell and vein-streaks greyish-white; base of cell scarlet. *Hindwing* black, basal dark area speckled with olive-grey scales, the vein edges and outer-bordering of marginal and submarginal spots greyish black, the

inner-bordering of the latter being ochreous-white with a few blue scales crossing the sub-marginal spots; the anal and two next spots in lower median interspace scarlet-bordered, the submedian interspace above the former being thickly white scaled; basal intersected patch scarlet.

Expanse, ♂ 5, ♀ 5 to 5½ inches.

The above description and our figures 1 ♂, and 1a ♀, on Plate 446, are from Sikkim specimens, taken in August by Mr. Otto Möller, now in Mr. W. Rothschild's collection at Tring; figure 1b is from a Sikkim female in our own possession. The type specimen described by Robbe was taken at Kurseong, Sikkim.

Form 2 (Plate 447, fig. 1, 1a, ♂, 1b, c, ♀).

Papilio Androgeos, Cramer, Pap. Exot. i. p. 142, pl. 91, fig. A, B (1776), ♂.

Iliades Mestor, Hübner, Verz. bek. Schmett. p. 89 (1816) ♂.

Papilio Mestor, Butler, Trans. Linn. Soc. Zool. 1877, p. 553, ♂ ♀. Distant, Rhop. Malay. p. 341, pl. 28, fig. 2, ♂, fig. 7, ♀ (1885).

Pap. Mem. Agenor aber. *Butlerianus*, Rothschild, Nov. Zool. ii. p. 320 (1895) ♀.

Papilio Esperii, Butler, *l.c.* p. 553, pl. 68, fig. 7, ♀. Distant, *l.c.* p. 341, fig. 1, ♂, fig. 6, ♀.

Male (fig. 1, 1a). Upperside blue-black, or olivescient bluish-black; cilia alternated with white. *Forewing* with greyish-blue scaled longitudinal streaks entirely bordering the outer veins to the margin, and less-defined similar streaks within the cell; base of the cell either without, or with a slender scarlet scaled streak, or frequently with a prominent narrow, or more rarely a broad scarlet patch is present. *Hindwing* with greyish-blue scaled broad streaks between the outer veins, extending to near the margin; a few similar coloured scales are also scattered within apex of the cell; occasionally a marginal row of blacker oval spots than the ground colour are somewhat apparent, of which the anal spot rarely show a few outer-bordering red scales. Underside. *Forewing* with broader and paler bluish-grey streaks, and a broad scarlet basal cell-patch. *Hindwing* darker blue-black or purpurescent-black, the outer border and edges of the outer veins generally paler or sometimes greyish-black; base of wing with a vein intersected scarlet patch; a marginal series of more or less apparent or well-defined black oval spots, and a submarginal similar series of conical spots, of which latter the anal spot is small and generally oval; the anal spot in both series is bordered or ringed with ochreous-red or scarlet, and the next one, and sometimes the second, of both rows are also red-bordered, and occasionally the fourth of the inner row; in specimens where the two series of black spots are less apparent beyond the red-bordered anal pair, their division is generally indicated by a bordering series of blue scales; the red borders of the anal spots are also sometimes sprinkled with blue scales. *Body*, legs, and antennæ black; front of thorax and head white-spotted.

Female (fig. 1b, c). Upperside black, the basal area darkest; basal cell-patch and a small streak below it scarlet; cell-streaks and anterior vein-borders fuliginous-grey or blackish-grey, the lower vein borders more or less, or entirely, white; more rarely the anterior vein borders are whitish and then form a subapical patch. *Hindwing* tailless. Purpurescent-black or bluish-black; with greyish-blue scaled-streaks between the outer veins, as in the male; a scarlet-bordered black spot at the anal angle, with the submedian interspace above it sometimes white. Underside. *Forewing* paler than the upperside; base of cell scarlet. *Hindwing* purpurescent or bluish-black; basal intersected patch scarlet; the borders of the more or less slightly-defined black marginal and submarginal spots paler, and the black anal and the two spots in the next interspace scarlet-bordered, the submedian-interspace above the former being white, and sometimes also the adjoining median-interspace is white and slightly black-scaled, the upper borders of the inner series of black spots, when defined, are more or less lunularly sprinkled with blue scales.

Expanse, ♂ $4\frac{1}{2}$ to 6, ♀ $4\frac{3}{4}$ to $5\frac{1}{2}$ inches.

We possess males of this form (*Androgeos*) from Sikkim; Jaintia Hills; Chittagong Hills, taken in October; Thoungeen and Tounghoo, Burma; and Mergui, Lower Tenasserim; and of the female (*Butlerianus*) from Bhamo, Burma, taken in November by Signor L. Fea. Males, taken in Beeling, Upper Tenasserim, in March and April, by Capt. E. Y. Watson, are in the British Museum.

Of our illustrations on Plate 447, fig. 1 is from a Jaintia Hill male, fig. 1a from an E. Bengal male; fig. 1b, a Darjiling female, and fig. 1c from a Jaintia Hill female.

Form 3 (Plate 448, fig. 1, ♂, fig. 2, 2a, ♀).

Papilio Phoenix, Distant, Rhop. Malay. p. 340, pl. 27, B, fig. 7 (1885) ♀.

Pap. Memnon Agenor aber. *Phoenix*, Rothschild, Nov. Zool. ii. p. 319 (1895) ♀.

Papilio Cilix, Distant, l.c. p. 340, pl. 29, fig. 5, ♀.

Pap. Mem. Agenor aber. *primigenius*, Rothschild, l.c. p. 319 (1895) ♂.

Male (*primigenius*—fig. 1). Upperside rich dark blue-black. *Forewing* with the scarlet streak at base of cell slender; outer vein-streaks blue-grey scaled, cell streaks less apparent. *Hindwing* with very prominent pale bluish-grey vein-streaks, the intervening black streak sharply defined; four lower outer-marginal ovate black spots encircled with bluish-white, the first spot anal. Underside. *Forewing* rich blue-black; the vein and cell streaks dark grey; basal cell-patch scarlet. *Hindwing* intense black; basal patch scarlet; with an anal, two lower submarginal, and three corresponding marginal completely grey-bordered black spots, the border of the anal and next spot being also slightly speckled with scarlet scales; the upper marginal spots incipient and partly grey-bordered, the upper submarginals lunularly

indicated by blue scales. In a second specimen (from Cherra Punji) the borders of the anal and two next submarginal spots and of the first marginal spot is thickly red-scaled.

Expanse, ♂ $4\frac{3}{4}$ to $5\frac{1}{2}$ inches.

Female (*Phœnix*—fig. 2, 2a). Upperside. *Forewing* black; base of cell and a small streak below it scarlet; cell and vein streaks fuliginous-grey or olivescent-fuliginous, the latter sometimes palest posteriorly. *Hindwing* tailless; blue-black or olivescent bronze-black basally; with an anal and a lower marginal row of deep black spots, the latter being either almost quadrate, or elongated and partly coalesced with the outer black lunules; the lower discal area below the cell, from the lower subcostal veinlet to the abdominal margin is white traversed by black veins, the border of the anal and marginal spots being more or less thickly scarlet scaled; the upper discal area from within apex of the cell is either more or less distinctly blue-grey scaled, or but very few scales are present. Underside. *Forewing* black; cell and vein streaks paler; basal cell patch red. *Hindwing* intense black; basal patch red; marginal black spots and lower discal white area similar to the upperside, the anal spots being red-bordered, the anterior spots, when present, are grey-bordered and the upper one inwardly red-bordered.

Expanse, ♀ $5\frac{1}{2}$ to $5\frac{3}{4}$ inches.

The type specimens of *primigenius*—the male we assign to this form—were obtained in the Khasia Hills, in April, 1889, by the Rev. W. A. Hamilton's native collectors, and are in Mr. W. Rothschild's collection. We have specimens of the female (*Phœnix*) from the Khasias, Sikkim, and Burma. Col. C. Swinhoe has the female from the Jaintia Hills.

Of our illustrations on Plate 448, fig. 1 represents the type male, named *primigenius*, from the Khasias; fig. 2 the female (*Phœnix*) is also from a Khasia specimen, and fig. 2a from a Sikkim specimen.

Form 4 (Plate 449, fig. 1, 1a, ♀).

Papilio Agenor, Linnæus, Syst. Nat. ed. x. p. 460, ♀ (1758); *id.* Mus. Lud. Ulr. p. 194, ♀ (1764); *id.* Syst. Nat. ed. xii. p. 747, ♀ (1767). Clerck, Icones Ins. i. pl. 15, fig. *supr.* ♀ (1759). Fabricius, Syst. Ent. p. 446, ♀ (1775). Cramer, Pap. Exot. i. p. 52, pl. 32, fig. A, B, ♀ (1775). Jablonsky, Nat. Schmett. ii. p. 20, pl. 8, fig. 3, ♀ (1784). Esper, Aus. Schmett. p. 108, pl. 26, fig. 1, ♀ (1792). Donovan, Ins. China, pl. 24, fig. 2, ♀ (1798). Distant, Rhop. Malay. p. 339, pl. 29, fig. 1, ♀ (1885).

Iliades Agenor, Hübner, Verz. bek. Schmett. p. 89, ♀ (1816).

Female. Upperside. *Forewing* black; basal cell patch scarlet; cell and vein-streaks olivescent-fuliginous or greyish-fuliginous. *Hindwing* tailless, but in some specimens with a short pointed tooth at end of upper median veinlet; olivescent-

black or bluish-black basally and speckled with blue scales, the marginal spots deeper black; discal area—and sometimes slightly including apex of the cell—pure white or pale ochreous-white, the anal spot and first marginal spot being generally outwardly-bordered with ochreous, the others with grey speckled outer borders, and sometimes all these borders are pale ochreous. Underside. *Forewing* with paler cell and vein-streaks; basal cell patch scarlet. *Hindwing* bluish-black, not blue-speckled basally; marginal spots with more defined grey outer-borders; basal patch scarlet.

Expanse, ♀ 5 to 6 inches.

Examples of this form of female, from Moulmein, Tavoy, Upper Tenasserim, taken in July, and others from Hong Kong, are in the British Museum. Mr. H. Grose-Smith has it from the Daunat Range, Burma.

Of our illustrations on Plate 449, fig. 1 is from a specimen taken in the Daunat Range, Burma, and fig. 1a also from a Burmese example.

Form 5 (Plate 449, fig. 2, 2a, ♀).

Papilio Alcanor, Cramer, Pap. Exot. ii. p. 107, pl. 166, fig. A, ♀ (1779). Esper, Aus. Schmett. p. 134, pl. 34, fig. 2, ♀ (1795).

Achillides Alcanor, Hübner, Verz. bek. Schmett. p. 85 (1816) ♀.

Papilio Mem. Agenor aber. *Alcanor*, Rothschild, Nov. Zool. ii. p. 320 (1895) ♀.

Papilio Agenor, Clerck, Icon. Ins. i. pl. 15, fig. *inf.* ♀ (1759).

Papilio Achates, Cramer (*nec* Sulzer), *l.c.* ii. p. 130, pl. 182, fig. A, B, ♀ (1779). Esper, *l.c.* p. 116, pl. 28, fig. 1, ♀ (1792). Butler, Trans. Linn. Soc. Zool. i. p. 553, ♂ ♀ (1877). Distant, Rhop. Malay. p. 342, pl. 28, fig. 3, 4, ♂, 5, ♀ (1885).

Iliades Achates, Moore, Journ. As. Soc. Bengal, 1889, p. 50, ♂ ♀.

Papilio Alphenor, Fabricius (*nec* Cramer), Spec. Ins. ii. p. 4, ♀ (1781). Jablonsky, Nat. Schmett. ii. p. 205, pl. 16, fig. 1, ♀ (1784).

Pap. Mem. Agenor aber. *Distantianus*, Rothschild, *l.c.* ii. p. 320 (1895) ♀.

Female. Upperside. *Forewing* black; basal cell-patch scarlet; cell and vein-streaks fuliginous, sometimes with whitish subapical area as in *Esperi*. *Hindwing* tailed; black or blue-black, in some greyish-black basally; with the fourth, third, or fully half of the cell, and a series of either four, five, or six adjoining discal elongate white patches, each disposed between the veins from the lower median upwards—occasionally, but very rarely, the cell patch is very small and the two central discal patches only are present; the submedian interspace is frequently also white basally; the discal patches are scarlet speckled outwardly; the borders of the anal rounded black spot, and the broad outer marginal lunules are also scarlet; the upper discal area and outer borders of the white discal patches, and also the entire submedian interspace when its white streak is absent, is more or less speckled with blue scales. Underside. *Forewing* paler; basal cell-patch scarlet; cell and vein-

streaks fuliginous-grey. *Hindwing* intense black or blue-black; the outer vein borders paler; basal patch scarlet; white apex of the cell, discal patches, anal spot and marginal lunules, as on the upperside, the red borders somewhat paler, and the upper lunules and their ciliæ being white or greyish-white, or these lunules are slightly red speckled. Abdomen with broad yellow-ochreous lateral bands.

Expanse, ♀ $5\frac{1}{2}$ to 6 inches.

Specimens of this form of female from the Khasia and Jaintia Hills; Shillong, Assam; Nepal; and Kyaikto, Tenasserim, the latter, taken in February, are in the British Museum. We have it from Nepal, taken by Gen. G. Ramsay; Rangoon and Tounghoo, Burma. The lower figure on Plate 15 of Clerck's *Icones*, evidently represents this form, with the tails broken off.

DISTRIBUTION.—This is "a very common species in Sikkim, and is found from April to December, from the Terai up to 5000 feet. The female is polymorphic, but three distinct forms may be defined, though each is more or less variable. The first form is tailless, and is more like the male; the second is also tailless, but has a large white patch on the hindwing; the third is tailed, and is marked with white spots on the disc of the hindwing. The second form of female is alone rare, the third form is the commonest of the three forms" (de Nicéville, *Sikkim Gazetteer*, 1894, 172). Mr. H. J. Elwes also records it as being "common in the lower valleys of Sikkim, and is found as high as 4000 to 5000 feet, from April until December. The common form of female is tailed, with a considerable amount of white in and beyond the cell of the hindwing; but tailless females are also found, without any white markings, and others with a broad white patch on the hinder margin of the forewing" (*Tr. Ent. Soc. Lond.* 1888, 428). Col. C. Swinhoe records it as "apparently very common in the Khasia Hills, in all its varieties" (*Tr. Ent. Soc. Lond.* 1893, 312). Mr. J. Wood-Mason obtained "forty-two males, six females (figured by Distant as female of *Mestor*, Hübn.), one female (*Agenor*, Cram.), eight females (*Alcanor* and *Achates*, Cram.), in the forests and gardens in and around Silcuri, Irangmara, the Doarband Pass, Hasooria, and Rupacherra, in Cachar, where it was almost always to be seen from April 3rd to August 10th. On one occasion all four forms were seen on the wing together in a group, having evidently just emerged from the chrysalis state, and a specimen of each was taken. All the forms of this species are inodorous" (*Journ. As. Soc. Bengal*, 1886, 373). Capt. E. Y. Watson, during the Chin-Lushai Expedition of 1889-90, took "one male (form *Ciliæ*) at Tilin, in March, one male and two females (form *Mestor*) at Tilin, in November and March" (*Journ. Bombay N. H. S.* 1891, 53). Col. C. H. E. Adamson records "the forms of female *Agenor* and *Achates* as being common throughout Burma. The form *Mestor* having been taken only in the Bhamo District. The male is a very rapid flyer, while the females are heavy, sluggish flyers and easily captured" (*List*,

1897, 47). Capt. E. Y. Watson found it "common in Rangoon, and Beeling, Upper Tenasserim" (J. Bombay N. H. S. 1888, 26). Dr. J. Anderson obtained it in "Mergui in December and March; at Thaing, King Island, in February, and on Elphinstone Island in March" (Journ. Linn. Soc. Zool. 1886, 50). It also occurs in Siam; Malay Peninsula; Hainan; Hong Kong; Formosa; S. China.

The larva of this butterfly does not appear to have yet been found in India or Burma. The larva of the allied species (*I. Memnon*) feeds on *Citrus* (Order Rutaceæ).

ILIADES MAYO (Plate 450, fig. 1, 1a, ♂; 1b, ♀).

Papilio Mayo, Atkinson, Proc. Zool. Soc. Lond. 1873, p. 736, pl. 63, fig. 1, ♂. Moore, P. Z. S. 1877, p. 592. Oberthür, Etudes Ent. iv. p. 34 (1879). Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1880, p. 237, ♂; *id.* 1881, p. 252, ♂ ♀. Staudinger, Exot. Schmett. i. p. 8 (1884). Haase, Untersuch. üb. Mim. p. 55, pl. 6, fig. 38, ♀, 39, ♂ (1893). Rothschild, Nov. Zool. ii. p. 322, ♂ ♀ (1895).

Papilio Charicles, Hewitson, Ann. and Mag. Nat. Hist. 1874, p. 356, ♀; *id.* Exot. Butt. v. *Pap.* pl. 14, fig. 45, ♀ (1875).

IMAGO.—Male. Upperside. Both wings rich purpurescent blue-black; cilia alternated slightly with white. *Forewing* generally with a more or less slightly-defined submarginal row of very short longitudinal ochreous-grey scaled streaks between the outer veins. *Hindwing* with a short tooth at end of the upper median veinlet; a transverse curved discal conspicuous cobalt-blue band, which is narrowest and broken at the costal end and extends to the abdominal margin above the anal angle, the band varying in width posteriorly from five-tenths to seven-tenths of an inch in its widest part, and is intersected by the black veins, its inner edges being curved and the outer edges sinuous. Underside. *Forewing* paler purpurescent blue-black; the crimson streak at base of the cell either slightly defined or absent; the submarginal short longitudinal streaks between the veins distinct and bluish-grey. *Hindwing* deep black; the crimson basal spots small and either slightly defined or distinct; with a transverse-discal curved row of blue-grey scaled lunules, the lower sometimes being more or less speckled with scarlet scales; an anal black spot either partly grey or scarlet bordered, and generally one, or two, lower-submarginal scarlet lunules. *Head* and thorax black; abdomen fuliginous-black; front of thorax white spotted; legs black above, greyish-white beneath; antennæ black.

Female. Upperside. Cilia alternated with white. *Forewing* fuliginous-black; with a large crimson basal cell patch; longitudinal cell-streaks fuliginous, outer vein-streaks paler fuliginous, broad, short, and extending from the median vein to one-third the outer margin. *Hindwing* intense black; with a large white cell-patch, three outer contiguous upper-discal smaller white spots, the upper one smallest, and

three short white streaks below the cell; outer-margin with broad scarlet spots, the upper lunular, the lower irregular shaped, the scarlet of the subanal sometimes extending upward in the lower median interspace and there enclosing a lengthened constricted black streak, which latter is either entire or broken; the submedian interspace from the angle for some distance upward is also scarlet and encloses a small black oval spot above the abdominal angle; end of the tail scarlet, the tip being white-scaled. Underside. *Forewing* pale olivescient-fuliginous; cell patch scarlet; cell-streaks olivescient-grey, vein-streaks, as in upperside, paler olivescient-grey and almost white posteriorly. *Hindwing* intense black; cell-spots scarlet; apex of cell and discal white markings, scarlet outer bordering, and tail tip, as on the upperside. *Abdomen* fuliginous-brown, paler laterally, and with pale ochreous-yellow apical segmental bands beneath.

Expanse, ♂ 5 to $5\frac{1}{2}$, ♀ 5 to 6 inches.

HABITAT.—S. Andamans.

DISTRIBUTION.—The type specimens of both sexes were obtained at Port Blair, S. Andamans, by the native collector, Moti Ram; other specimens were also obtained by Mr. F. de Roepstorff.

ILIADES POLYMNESTOROIDES (Plate 451, fig. 1, ♂, 2, ♀).

Male. Upperside rich blue-black; cilia very slenderly alternated with white. *Forewing* with a transverse outer-discal row of short longitudinal pale greyish-blue scaled outer-vein streaks, these streaks being restricted uniformly towards the exterior margin, and decrease in width upward to the costa. *Hindwing* with a discal band formed of prominently defined pale greyish-blue scaled vein-streaks, these streaks decreasing to a point outwardly and do not reach the margin. Underside blue-black; base of both wings with the normal scarlet patch. *Forewing* with the vein-streaks paler, broader and longer than on the upperside, but uniformly terminate at some distance from the outer margin; cell streaks less defined. *Hindwing* with prominently grey-bordered submarginal and marginal black spots, the anal borders slightly tinged with red.

Female. Upperside. *Forewing* black, the basal area darkest; base of cell and a minute streak below it scarlet; vein borders and cell streaks pale fuliginous-grey. *Hindwing* greyish-black basally, the outer area fuliginous-grey, traversed by a marginal and submarginal series of greyish-black conical spots, the discal area and apex of cell being densely irrorated with greyish-blue scales. Underside. *Forewing* with greyish-white vein and cell-streaks; base of cell scarlet. *Hindwing* black, base scarlet; marginal and submarginal black spots broadly greyish-white bordered.

Expanse, ♂ 5, ♀ 6 inches.

HABITAT.—N. E. India.

DISTRIBUTION.—The type specimen of the male (fig. 1) was taken in the Jaintia Hills, Assam, by Col. Swinhoe's native collectors, and is now in the collection of Mr. W. Rothschild at Tring. The female (fig. 2) was taken by Mr. James Rothney, in Barrackpur Park, near Calcutta, in March, 1886, and is now in our own collection.

ILIADES POLYMNESTOR (Plate 452, fig. 1 larva and pupa, 1a, ♂, 1b, ♀).

Papilio Polymnestor, Cramer, Pap. Exot. i. p. 83, pl. 53, fig. A, B, ♂ (1775). Goeze, Ent. Beytr. iii. 1, p. 83 (1779). Fabricius, Spec. Ins. ii. p. 9 (1781). Jablonsky, Nat. Schmett. ii. p. 11, pl. 7, fig. 3, 4 (1784). Esper, Ausl. Schmett. p. 77, pl. 19, fig. 1 (1785). Donovan, Ins. of India, pl. 20, fig. 2, ♀ (1800). Godart, Ency. Méth. ix. p. 29 (1819). Lucas, Lep. Exot. p. 21, pl. 12, fig. 1 (1835). Boisd. Spec. Gén. Lep. i. p. 191 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Chenu, Ency. Hist. Nat. Pap. pl. 3, fig. 2 (1851). Moore, Catal. Lep. Mus. E. I. Company, i. p. 101, pl. 3, fig. 1, 1a larva and pupa (1857); *id.* P. Z. S. 1865, p. 756. Butler, Catal. Fabr. Lep. B. M. p. 256 (1869). Staudinger, Exot. Schmett. i. p. 8 (1884). de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Elwes, Tr. Ent. Soc. Lond. 1888, p. 430. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 366. Betham, *ib. l.c.* 1892, p. 325. Rothschild, Nov. Zool. ii. p. 324 (1895).

Iliades Polymnestor, Hübner, Verz. bek. Schmett. p. 88 (1816). Swinhoe, P. Z. S. 1885, p. 144.

Papilio (Iliades) Polymnestor, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446.

IMAGO.—Male. Upperside rich blue-black; cilia alternated with white. *Forewing* with a transverse discal pale bluish-grey scaled interrupted band composed of short longitudinal streaks between the veins, these streaks being most intense and widest posteriorly, and decreasing both in width and length anteriorly, where they obsolescently terminate at the lower subcostal branch. *Hindwing* with the outer area, from a fourth, or third, of the apex of the cell, pale greyish-blue, crossed by a curved discal series of seven black spots, situated between the veins, these spots being either oval or broadly conical; followed by a submarginal similar row of spots and then a marginal row of angled spots, these latter being at the vein ends decreasing anteriorly in width, and sometimes there partly coalesce with the opposite submarginal spot. Underside duller blue-black. *Forewing* with a crimson basal cell streak; discal vein-streaks extending anteriorly to the costa, these being dull ochreous-grey anteriorly and bluish-grey posteriorly. *Hindwing* with crimson basal patches; the outer discal area, from beyond the cell, dull ochreous-grey, traversed by the discal, submarginal, and marginal black spots, as on upperside.

Female. Upperside. *Forewing* duller black, in some fuliginous-black, with the cell streaks and that between the veins black; the discal streaks paler bluish-grey; base of cell sometimes sparsely speckled with crimson scales. *Hindwing* similar to

the male; the outer area slightly paler bluish-grey. Underside paler than male, duller black. *Forewing* with crimson basal streak, the cell and vein-streaks paler than on upperside. *Hindwing* with basal crimson spots; outer area similar to male, but paler. *Body*, legs, and antennæ black; femora beneath greyish.

Expanse, ♂ $5\frac{1}{2}$ to $5\frac{3}{4}$, ♀ 6 to $6\frac{1}{4}$ inches.

LARVA AND PUPA.—(See Plate 452, fig. 1.)

HABITAT.—South, Central, and Eastern India; Sikkim; Burma.

DISTRIBUTION, HABITS, &c.—“Common in the Kanara District of Bombay, wherever the country is sufficiently wooded, most so about September to October. The favourite food of the larva being a Wild Lime, which occurs in all the forests” (Davidson and Aitken, Journ. Bombay N. H. S. 1896, 580). “We noticed this butterfly at Matheran, in March, laying its eggs on a Lime tree in the garden. In Karwa, we reared a great many in September and October, on a common wild orange (*Atalantia* sp.); another favourite food appeared to be *Garcinia Xanthochymus*. In form, colour, and markings the larva is very similar to that of *P. Polytes* and *P. Erithonius*, but the enlargement on the 4th and 5th segments is much exaggerated, especially after the last moult. In the pupa, the headcase and its two projecting points are more elongated” (*ib. l.c.* 1890, 376). “The food-plants of the larva, according to the observations of Messrs. Davidson, Aitken and Bell, are *Paramigyna monophylla* and *Atalantia monophylla*; Order Rutaceæ” (de Nicéville, J. As. Beng. 1900, 258). Col. C. Swinhoe obtained this butterfly on Matheran, Parbutti Hill, Poona, Bombay, in November” (P. Z. S. 1885, 144). It is “fairly common in the neighbourhood of Koonoor, but avoids the sunlight, and flutters softly about in the deep gloom of the most secluded groves of Fig and Mango trees. When feeding they are so absorbed that they may be taken between the thumb and finger without much difficulty” (E. L. Arnold, Ent. Mo. Mag. 1880, 137). Mr. G. F. Hampson obtained it on the “Nilgiris, from 2000 to 7000 feet” (J. As. Soc. Beng. 1888, 364). Mr. S. N. Ward writes, “Found at all heights from the top of the Nilgiris and Shevaroy to the coast. It is commonest during the monsoon, but I have seen it in first locality in April” (MS. Notes). Mr. H. S. Ferguson found it “common in Travancore, more so in the low country than in the Hills” (J. Bombay N. H. S. 1891, 446). Lieut. E. Y. Watson took it in “Madras, in June” (J. As. Soc. Beng. 1890, 268). Mr. W. C. Taylor records it as “rather common at Khorda, in Orissa” (List, 1888, 16). Mr. Betham obtained it in the Central Provinces (J. Bombay N. H. S. 1892, 325). Mr. W. S. Atkinson records it as “not uncommon in the Plains of Southern Bengal, west of the Ganges; but does not reach the Hills” (MS. Notes). Mr. L. de Nicéville says it “occurs in the neighbourhood of Calcutta throughout the hot weather, first appearing at the end of March. I have bred the larva on Pomelo (*Citrus decumana*)” (J. As. Soc. Beng.

1885, 51). Mr. H. J. Elwes records "a single specimen of the female taken in Sikkim in 1887, by Mr. O. Möller's collectors—probably a straggler from the Plains" (Tr. Ent. Soc. 1888, 430). Mr. E. Blyth, writing from Paphoon, on the Yunzalin River, a tributary to the Salween, Burma, says, "I twice saw this fine butterfly (*Polymnestor*), which I had hitherto only seen from Lower Bengal" (J. As. Soc. Beng. 1861, 392).

ILIADES PARINDA (Plate 453, fig. 1, larva and pupa, 1a, ♂, 1b, c, ♀).

Iliades Parinda, Moore, Lep. of Ceylon, i. p. 148, pl. 60, fig. 1, ♂, 1a, ♀, 1b, c, larva and pupa (1881).

Papilio Polymnestor Parinda, Rothschild, Nov. Zool. ii. p. 330 (1895).

IMAGO.—Male. Upperside similar to *I. Polymnestor*. Forewing with the pale bluish-grey band somewhat broader posteriorly. Hindwing with the pale bluish-grey outer area usually extending from across middle of the cell. Underside similar to *Polymnestor*. Forewing with the outer vein-streaks more distinctly ochreous anteriorly. Hindwing with the outer discal area more distinctly ochreous.

Female. Upperside. Forewing fuliginous-black; with the cell and outer vein streaks pale greyish-ochreous, the latter palest or ochreous-white hindward, being longer and broader than in same sex of *Polymnestor*, those from the middle median upward are united at their base, and extend inward to the cell; basal cell patch crimson. Hindwing similar to the male, except that the outer area is paler, and inwardly more or less tinged or clouded with pale ochreous. Underside. Basal patches dark crimson. Forewing with the cell-streaks and the vein-streaks pale greyish-ochreous, the latter longer and extend inward to the cell from the lower median. Hindwing with the outer area, from within apex of the cell, more uniformly tinted with pale ochreous than on the upperside.

Expanse, $5\frac{1}{2}$ to 6 inches.

LARVA.—Smooth, glossy-green; with a whitish lateral lower band from sixth to anal segment, a broad similar coloured band obliquely ascending the eighth and ninth, and a similar band on the tenth segment; anterior shield edged with white, its posterior dorsal end bordered by a transverse blackish-marked crest, a similar crest also across the fourth segment ending on each side in a large ocellated spot. Feeds on *Citrus decumana*.

PUPA.—Green or olive-brown.

DISTRIBUTION AND HABITS.—"An abundant species in the low country and lower hill districts in Ceylon. The females are much rarer than the males. It is a very conspicuous insect on the wing. The larva feeds on Rutaceæ, especially on the plants of the genus *Citrus*" (Dr. N. Manders, J. As. Soc. Beng. 1899, 222). Mr.

F. M. Mackwood states that it is "found all over the island, predominating in the low country. March and April the principal time for emergence from chrysalis. Very difficult to capture perfect." Capt. F. J. Hutchison says, "Western Central and Southern provinces of the island, both Plains and Hills, in forest and open ground. Taken at Colombo from April to end of December; elsewhere at various times. It has a slow majestic flight; flaps the wings a great deal. Is quite fearless and easily caught hovering over flowers." Capt. H. Wade obtained it at "Kandy and Galle." Sir J. E. Tennent (Nat. Hist. Ceyl. 425) says the butterfly "darts rapidly through the air, alighting on the ruddy foliage of the *Hibiscus*, or the dark green foliage of the *Citrus*, on which it deposits its eggs. The larva has a hump on the fourth or fifth segment, and from this hump, on being irritated, it protrudes a horn of an orange colour, bifurcate at the extremity, and covered with a pungent mucilaginous secretion, and strikes it upon the offending object with unerring aim" (Lep. Ceylon i. 149).

INDO-MALAYAN SPECIES.—*Iliades Memnon* (Papilio Memnon, Linn. Syst. Nat. ed. x. p. 460, ♂ (1758). Cramer, Pap. Exot. i. p. 142, pl. 91, fig. C, ♂ (1776). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 5, ♂ (1776). Jablonsky, Nat. Schmett. i. p. 210, pl. 6, fig. 2, 3, ♂ (1783). Rømer, Gen. Ins. Linné, p. 17, pl. 12, fig. 5, ♂ (1789). Esper, Ausl. Schmett. p. 86, pl. 20, fig. 3, ♂ (1790). Godart, Enc. Méth. ix. p. 29 (1819). Horsfield, Catal. Lep. Mus. E. I. Company, i. pl. 3, fig. 3, 3a, larva and pupa (1828). Swainson, Zool. Illust. iii. pl. 95 (1833). Boisd. Spec. Gén. Lep. i. p. 192 (1836). De Haan, Verh. N. G. Ned. pl. 3, fig. 2, 3, ♀ (1840). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Wallace, Tr. Linn. Soc. xxv. p. 46, pl. 1, fig. 1, ♂, 2, 3, 4, ♀ (1865). Piepers, Tijds. v. Ent. 1888, p. 350, pl. 8, fig. 5, larva. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 515, ♂ ♀. Rothschild, Nov. Zool. ii. p. 312 (1895). *Iliades Memnon*, Hübn. Verz. bek. Schmett. p. 89, ♂ (1816). *Syn.* Pap. atrovenatus, Goeze, Ent. Beyt. iii. 1, p. 44 ♂ (1799). Seba Thes. iv. pl. 16, fig. 10, 11, ♂ (1765). Pap. Achates, Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 2, ♀ (1776). Cramer, *l.c.* iii. p. 84, pl. 243, fig. A, ♀ (1782). Jablonsky, *l.c.* ii. p. 179, pl. 15, fig. 1, ♀ (1784). Rømer, *l.c.* p. 68, pl. 12, fig. 2, ♀. Pap. Laomedon, Cramer, *l.c.* i. p. 78, pl. 50, fig. A, B, ♀ (1776). Pap. Ancus, Cram. *l.c.* p. 44, pl. 222, fig. A, B, ♀ (1792). Jablonsky, *l.c.* ii. p. 15, pl. 8, fig. 1, ♀ (1784). Esper, *l.c.* p. 135, pl. 35, fig. 1, ♀ (1788). Pap. Achatides, Esper, *l.c.* p. 118, pl. 18, fig. 2, ♀; pl. 29, fig. 1, ♀ (1786). Pap. Arbates, Zink.-Som. Nov. Act. Acad. N. C. xv. p. 151, ♂ (1831). Pap. Memnon var. Javanus et Erebinus, Haase, Untersuch. üb. Mim. p. 57, ♀ (1894). Pap. Mem. aber. Sericatus, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 427, ♂. *Note.*—Dr. L. Martin records having "frequently bred *Pap. Memnon*, and obtained all four forms of the female from eggs laid by one mother. In another case four eggs deposited by a tailed female of form 4, did not yield a

single tailed descendant like herself" (Journ. As. Soc. Bengal, 1895, 516). *Habitat.* Java; Sumatra; Nias; Natuna Isles; Borneo.—*Iliades Oceani* (Pap. *Iliades Oceani*, Doherty, Journ. As. Soc. Bengal, 1891, p. 31, ♂ ♀. Pap. *Memnon Oceani*, Rothschild, Nov. Zool. ii. p. 315. *Habitat.* Engano Island.—*Iliades Thunbergii* (Pap. *Thunbergii*, Siebold, Hist. Nat. Japon, p. 16, ♂ (1824). *Habitat.* S. Japan. *Iliades Pryeri* (Pap. Mem. subsp. *Pryeri*, Rothschild, Nov. Zool. ii. p. 321, ♂ ♀ (1895). Pap. *Memnon*, var. *De Haan*, Verh. Nat. Ned. p. 24, pl. 3, fig. 1, ♂ (1840). *Pryer*, Rhop. Nip. pl. 2, fig. 1, ♀ (1886). Leech, Butt. of China, &c., p. 545, ♂ ♀ (1893). Rothschild, *l.c.* p. 321 (1895). *Habitat.* Loo Choo Islands.—*Iliades Lowii* (Pap. *Lowii*, Druce, P. Z. S. 1873, p. 358, pl. 33, fig. 6, ♂. Rothschild, *l.c.* p. 321 (1895). *Habitat.* Palawan; Philippines.—*Iliades Rumanzovia* (Pap. *Rumanzovia*, Eschscholtz, Kotzebue's Reise, iii. p. 204, pl. 2, fig. 4a, b, ♀ (1821). Thon, Nat. Schmett. p. 17, pl. 5, fig. 6, 7, ♀ (1837). Semper, Phil. Tagf. p. 279, pl. B, fig. 9 (1892). Rothschild, *l.c.* p. 322, ♂ ♀ (1895). *Syn.* Pap. *Krusensternia*, Esch. *l.c.* p. 205, pl. 3, fig. 5a, b, ♂ (1821). *Iliades Emalthion*, Hübner, Samml. Ex. Schmett. ii. pl. 117, ♂ (1822). Pap. *Emalthion*, Gray, Catal. Lep. B. M. i. p. 14, pl. 5, fig. 4 ♀ (1852). Pap. *Floridor*, Godart, Enc. Méth. ix. Suppl. p. 809, ♂ ♀ (1823). Pap. *Descombesii*, Roger, Bull. Soc. Linn. Bord. i. (1826). Pap. *Semperinus*, Haase, Unters. üb. Mim. p. 55, ♀ (1893). *Habitat.* Philippine, Sulu, Sangir, and Talaut Isles.—*Iliades Lampsacus* (Pap. *Lampsacus*, Boisd. Spec. Gén. Lep. i. p. 190 (1836). *De Haan*, Verh. Nat. Gesch. Ned. p. 23, pl. 2, fig. 2 (1840). Rothschild, *l.c.* p. 330 (1895). *Habitat.* Java.—*Iliades Forbesi* (Pap. *Forbesi*, Grose-Smith, Ann. N. H. 1883, p. 234; *id.* Rhop. Exot. i. Pap. pl. 1, fig. 1, 2, ♂ (1885). Martin, Tijds. v. Ned. Ind. 1893, p. 4, ♂ ♀. *de Nicéville*, Journ. As. Soc. Bengal, 1895, p. 517, ♂ ♀. Rothschild, *l.c.* p. 331 (1895). *Habitat.* Sumatra.—*Iliades Acheron* (Pap. *Acheron*, Grose-Smith, Ann. N. H. 1887, p. 432, ♂; *id.* Rhop. Exot. i. Pap. pl. 5, fig. 1, 2, ♂ (1888). Rothschild, *l.c.* p. 321 (1895). *Habitat.* N. Borneo.

Genus CHARUS.

Charus, Moore, Lep. of Ceylon, i. p. 149 (1881).

Papilio (part), Doubleday and Hewitson, Gen. D. Lep. i. p. 5 (1846).

Papilio (sect. 60, subsect. B), Felder, Verh. Z. B. Ges. Wien. pp. 319, 367 (1864).

Papilio (group 6), Rothschild, Nov. Zool. ii. p. 282 (1895).

IMAGO.—*Forewing* shorter, broader, and more regularly triangular than in *Iliades*; costa much arched in the middle; cell much broader; exterior margin very slightly scalloped; outer area of upperside in the male clothed with very fine short hairs so densely as to conceal the scales beneath. *Hindwing* comparatively shorter and more triangular in shape, being less produced hindward; exterior margin more

deeply scalloped; tailed in both sexes; basal area of upperside very hairy. Antennal club shorter; hind tibia slender, with rows of short fine spines. Sexes similar.

LARVA AND PUPA.—Similar to *Iliades*.

TYPE.—C. Helenus.

CHARUS HELENUS (Plate 454, fig. 1, 1a, b, ♂, 1c, ♀).

Papilio Helenus, Linnæus, Syst. Nat. x. p. 459 (1758); *id.* xii. p. 745 (1767). Clerck, Icones Ins. i. pl. 13, fig. 2 (1759). Linn. Mus. Ulr. p. 185 (1764). Houtt. Nat. Hist. i. 2, p. 191, pl. 8, fig. 1 (1767). Müller, Naturs. v. p. 567, pl. 17, fig. 1 (1774). Fabricius, Syst. Ent. p. 443 (1775). Cramer, Pap. Exot. ii. p. 90, pl. 153, fig. A, B (1777). Esper, Ausl. Schmett. p. 18, pl. 2, fig. 2 (1784). Jablonsky, Nat. Schmett. ii. p. 166, pl. 14, fig. 4, ♂ (1784). Godart, Encyc. Méth. ix. p. 68 (1819). Boisduval, Spec. Gén. Lep. i. p. 211 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 11 (1846). Moore, Catal. Lep. Mus. E. I. C. i. p. 101 (1857); *id.* Proc. Zool. Soc. 1865, p. 757; *id.* 1878, p. 840. Butler, Tr. Linn. Soc. Lond. Zool. i. p. 553 (1877-9). de Nicéville, Journ. As. Soc. Bengal, 1881, p. 59. Elwes, Proc. Zool. Soc. 1881, p. 873; Tr. Ent. Soc. 1888, p. 429. Aurivillius, Kongl. Sv. Vet. Akad. Handl. 1882, p. 10. Staudinger, Exot. Schmett. i. p. 7 (1884). Distant, Rhop. Malay. p. 343, pl. 29, fig. 3, ♂ (1885). Manders, Tr. Ent. Soc. 1890, p. 536. Leech, Butt. of China, ii. p. 548 (1893). Oberthür, Etud. Ent. xvii. p. 4 (1893). Rothschild, Nov. Zool. ii. p. 284 (1895).

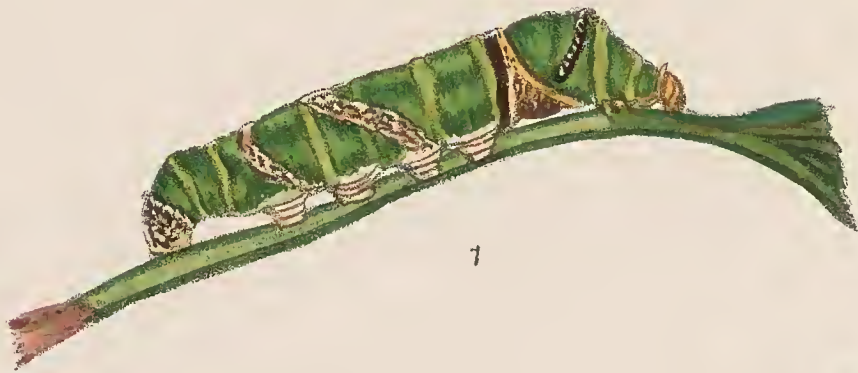
Achillides Helenus, Hübner, Verz. bek. Schmett. p. 85 (1816).

Charus Helenus, Moore, Journ. Linn. Soc. Zool. 1886, p. 51. Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 312.

Papilio (Charus) Helenus, Doherty, Journ. As. Soc. Bengal, 1886, p. 137. Elwes and de Nicéville, *ib.* 1886, p. 436. Watson, Journ. Bombay N. H. Soc. 1891, p. 54. de Nicéville, Sikkim Gaz. 1894, p. 172.

Papilio Helenus, aber. *rufatus*, Rothschild, Nov. Zool. ii. p. 286 (1895).

IMAGO.—Male. Upperside rich brownish-black; cilia alternated with white. *Forewing* with slender longitudinal streaks of golden-yellow scales within the cell, and hairy-scaled broad streaks between the outer veins; lower base of the wing also sparsely speckled with golden-yellow scales. *Hindwing* with a cream-white upper discal patch composed of three portions, a short almost quadrate portion in the costal interspace, and two lower large elongate portions in the subcostal interspaces, a few white or grey scales also being present below the lower portion; at the anal angle is a dark purple-red circlet which generally partly encloses a round black spot, followed by a lower submarginal series of three, sometimes four, more or less apparent purple-red incurved lunules, the first or lower one sometimes forming a circle round a black spot; in some specimens the lower lunule is obsolescent, in others all the latter are obsolete. Underside paler. *Forewing* with prominent greyish-white scaled slender cell-streaks and broad outer vein-streaks. *Hindwing* with the upper basal area speckled with greyish-white scales, and three similar scaled slender longitudinal streaks within the cell, the base of the median and







1



1a

1b





2^a



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GENERIBUS ET SPECIEBUS ANIMALIUM
IMPOSITA SUNT

SOCIETATIBUS ERUDITORUM ADIUVANTIBUS

A

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USQUE AD FINEM DECEMBRIS, MDCCC*

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submedian vein also being white scaled; upper discal white patch composed of three smaller portions than on the upperside; anal ocellus and a complete series of submarginal lunules dark red; an inner subanal confluent lunule also present in the lower median interspace; the anal and subanal lunules being speckled with violet-blue scales; beyond is a marginal row of more or less defined red-and-white scaled lunules.

Female. Upperside and underside similar to the male, except that the base of the hindwing is paler.

Body brownish-black; collar, front of head and palpi white-spotted; tegulæ white fringed; legs and antennæ black.

Expanse, ♂ 4 to $5\frac{1}{2}$, ♀ 5 to $5\frac{1}{4}$ inches.

HABITAT.—W. and E. Himalayas; Khasias; Burma; Tenasserim; Malay Peninsula; Siam; Hong Kong; S. China; Hainan.

DISTRIBUTION.—In the Western Himalaya Mr. P. W. Mackinnon took "a single specimen of the male in the Dehra Dun, in April, this being the most westerly point from which it has been recorded" (J. Bombay N. H. S. 1898, 592). Mr. W. Doherty obtained it in the "Kali Valley, Divalisera, Kumaon, at 2000 feet elevation; scarce." Gen. G. Ramsay obtained it in Nepal (J. As. S. Bengal, 1886, 137). Mr. H. J. Elwes found it "one of the commonest species of Papilio in Sikkim at all elevations up to 5000 or 6000 feet, but most numerous in the low valleys from April to October" (Tr. Ent. Soc. 1888, 429). Mr. de Nicéville also records it as "found in Sikkim throughout the summer, commonly at the lower elevations and as high as 6000 feet" (Sikkim Gaz. 1894, 172). Col. C. Swinhoe says it is "apparently a rare species in the Khasia Hills, two examples from Shillong only, been received" (Tr. Ent. Soc. 1893, 312). Mr. J. Wood-Mason obtained fourteen males and three females in the forests around Silcuri, Cachar, from May 7th to August 20th" (J. As. Soc. Beng. 1886, 375). Col. C. H. E. Adamson says it is "common in Burma wherever there is forest land" (List, 1897, 47). Capt. E. Y. Watson found it not "uncommon during the dry-season, January to June, in the Chin Hills, Burma, up to 4000 feet elevation" (J. Bombay N. H. S. 1897, 651). Signor L. Fea obtained it in the Karen Hills, at Bhamo, in October, and at Meteleo in August and September. Dr. N. Manders found it "abundant in the Shan States, but difficult to secure in good condition, as it has a habit of flying in and out of bushes and soon tatters" (Tr. Ent. Soc. 1890, 536). Mr. O. Limborg obtained it at Hatseiga, and on the road from Moolai to Moolat, at 4000 feet elevation" (P. Z. S. 1878, 840). "Several males were taken at Ponsekai, Tavoy, and a few in the Hills on the Siam frontier" (J. As. S. Beng. 1886, 436). Dr. J. Anderson took it on "Owen Island, Mergui Archipelago, in January" (J. Linn. Soc. Zool. 1886, 51). In Hong Kong, Mr. J. J. Walker, R.N., found it "a very common butterfly, of which stragglers are met with in December and January,

and fresh examples were observed in February. The flight is strong, undulating, and very erratic, and it is by no means easy to secure in good condition. The larva is found not rarely on the leaves of various Aurantiaceæ" (Tr. Ent. Soc. 1895, 469).

CHARUS DAKSHA (Plate 455, fig. 1, *larva* and *pupa*, 1a, ♂, 1b, ♀).

Papilio (*Charus*) *Daksha*, Moore, Journ. As. Soc. Bengal, 1888, p. 363.

Papilio Daksha, Davidson and Aitken, Journ. Bombay N. H. Soc. 1896, p. 580, pl. 6, fig. 3, 3a, *larva* and *pupa*.

Papilio Helenus Daksha, Rothschild, Nov. Zool. ii. p. 286 (1895). de Nicéville, Journ. As. Soc. Beng. 1900, p. 258.

Papilio Helenus, Moore, Catal. Lep. Mus. E. I. C. i. pl. 3, fig. 2, 2a, *larva* and *pupa* (1857). Swinhoe, P. Z. S. 1885, p. 145. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 367.

Papilio (*Charus*) *Helenus*, Ferguson, Journ. Bombay N. H. S. 1891, p. 447.

IMAGO.—Male and female differs from *C. Helenus* in the shorter and more triangular form of the forewings. Male. Upperside. *Hindwing* with the three portions of the upper discal creamy-white patch much wider, the upper portion being twice the width of that in *Helenus*, the lower portion extending to the discocellular veinlet, and generally also along its edge within the cell, the lower portion also having a cluster of greyish-white scales decreasingly extending to near the lower median veinlet; anal and the submarginal red lunules similar, the anal with an upper bordering of blue scales. Underside. *Forewing* with the greyish-white outer vein-streaks shorter than in *Helenus*, crossing the discal area midway between end of the cell and the exterior margin. *Hindwing* with the discal white patch wider; and generally there are two lower-discal additional red lunules present between the subanal and the white patch.

Female. Upperside somewhat paler than in the male. Underside also paler. *Forewing* with the pale vein-streaks inwardly more distinct. *Hindwing* similar to the male.

Expanse, ♂ $4\frac{3}{4}$ to 5, ♀ 5 to $5\frac{1}{2}$ inches.

HABITAT.—South India.

LARVA AND PUPA.—(See Plate 455, fig. 1.)

DISTRIBUTION, ETC.—“This butterfly may be met with in the Kanara District of Bombay, wherever the country is sufficiently wooded, in the same situations as *Polymnestor*, and at any time of the year, but is not nearly so numerous” (Davidson and Aitken, J. Bombay N. H. S. 1896, 580). “We got one larva of this butterfly on the Tirphal (*Zanthoxylum Rhetsa*), a horribly thorny tree, leafless in the dry season. The larva has the 4th and 5th segments even more tumid than in *Polymnestor*, forming a broad and high hump, nearly flat on the top, and bounded before and behind by rugged ridges of a whitish or pale grey colour, chequered with fine brown

lines, the anterior ridge ending in a large black and white ocellus on each side. The pupa was distinguishable from that of *Polymnestor* chiefly by the two projecting points on the head being somewhat curved upwards" (*ib. l.c.* 1890, 367). The larva also "feeds on *Citrus decumana* and *Citrus medica*" (de Nicéville, J. As. S. Bengal, 1900, 258). Mr. S. N. Ward, in his MS. Notes, writes, "It is found from the top of the Nilgiris and Shevaroyes to the coast on both sides, chiefly after the monsoon. It likes the forest and may be seen early over the trees low down on the mountain passes. Like *Polymnestor* it is fond of hovering about watery and muddy places. The larva feeds on the Orange and Lime, but is exceedingly difficult to find." It is "common on the Nilgiris from 1000 to 7000 feet elevation. The larva feeds on Orange, and has the power of protruding two pink horns from the head with a delicious scent. It will always do this if taken up by a pair of scissors, or by the beak of a bird" (G. F. Hampson, *l.c.* 363). Mr. H. S. Ferguson records it as "common in the Travancore Hills from 2000 feet upwards" (J. Bombay N. H. S. 1891, 446). Col. C. Swinhoe took it in Poona, Bombay (P. Z. S. 1885, 145).

Our illustrations of the larva and pupa on Plate 455 are from the late Mr. S. N. Ward's original drawings.

CHARUS MOOREANUS.

Papilio Helenus Mooreanus, Rothschild, Nov. Zool. ii. p. 286 (1895).

Charus Helenus, Moore, Lep. of Ceylon, i. p. 149, pl. 58, fig. 3, ♂ (1881).

IMAGO.—Upperside brownish-black. *Forewing* with sparsely irrorated golden-yellow scaled streaks within the cell and between the outer veins. *Hindwing* with a broad pale yellow upper-discal patch, which has an irregular outer border; an indistinct crimson slender lunule above anal angle, and other lower-submarginal lunules, these latter being more distinct in the female; a few yellow scales on the disc below the patch. Underside. *Hindwing* with the discal white patch as above, and a complete series of seven subdiscal blue lunules, of which the three anterior stand at the outer edge of the white discal patch, and the two posterior are situated within the anal and subanal rufous spots.

Expanse, $4\frac{1}{2}$ to $5\frac{1}{2}$ inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Mr. F. M. Mackwood says this butterfly is "found principally in open glades, and roadways in the jungle, from about 2000 to 4000 feet elevation. Capt. Wade took it at Kandy, Ambogamma and in the Kottowa forest. It frequents high jungle only, in suitable country; not uncommon" (Lep. Ceylon, i. 149). Dr. N. Manders records it as "a very common insect in Ceylon, at all elevations, but especially so in the low country" (J. A. S. Beng. 1899, 222).

CHARUS ISWARA (Plate 456, fig. 1, ♂, 1a, ♀).

Papilio Iswara, White, Entom. i. p. 280 (1842). Doubleday and Hewitson, Gen. D. Lep. i. p. 11, pl. 2, fig. 1 (1846). Gray, Catal. Lep. B. M. i. p. 19 (1852). Moore, Catal. Lep. Mus. E. I. C. i. p. 101 (1857). Felder, Verh. Z. B. Ges. Wien. p. 320 (1864). Wallace, Trans. Linn. Soc. Lond. 1865, p. 51. Butler, *ib.* 1877, p. 553. Distant, Rhop. Malay. p. 344, pl. 30, fig. 1, ♂, 2, ♀ (1885). Hagen, Berl. Ent. Zeit. 1892, p. 154; *ib.* Iris, 1894, p. 21. Rothschild, Nov. Zool. ii. p. 288 (1895).

Charus Iswara, Moore, Journ. Linn. Soc. Lond. Zool. 1886, p. 51.

IMAGO.—Male. Upperside rich brownish-black; cilia slightly alternated with white. *Forewing* with slender longitudinal golden-yellow scaled cell streaks and hairy-scaled broader outer vein-streaks, the latter palest posteriorly; lower base of the wing also golden-yellow scaled. *Hindwing* with a large broad creamy-white upper-discal patch composed of four portions; the outer edge of the lower portion not sharply-defined, but thickly white scaled, and with a decreasing cluster of similar scales extending from its lower edge; an incurved anal and a lower marginal lunule dark crimson. Underside. *Forewing* duller coloured, bluish-black; cell streaks prominent and bluish-grey; vein streaks short, broad, bluish-grey and uniformly restricted midway across the wing. *Hindwing* blue-black; upper basal area speckled with grey scales; cell streaks and base of the veins grey-scaled; the upper-discal white patch as above, but not so broad, and followed by two lower small more-or-less-defined white or greyish-white scaled lunular spots placed in the median interspaces; a large dark red anal incomplete ocellus and a red lower marginal complete ocellus, the former being inwardly bordered with blue scales, and followed by three lower-discal blue-scaled lunules; outer margin with a slender white cilia-lunule between the veins, the upper being somewhat wider.

Female. Upperside. *Forewing* brownish-black, the cell and vein-streaks paler, the latter more distinct, and fuliginous-grey posteriorly. *Hindwing* with similar large discal white patch as in male, but with its anterior portion shorter, the lower decreasing cluster of white scales prominent; a large dark crimson anal and a lower marginal ocellate-spot. Underside. *Forewing* paler; similar to the male. *Hindwing* also similar to the male, except that the two lower-discal white-scaled lunules are larger, and the red anal and lower marginal ocellate-spot complete, their black centre being smaller. *Body* brownish-black; front of thorax and head white spotted; abdomen with a lateral row of white dots and longitudinal whitish scaled streaks.

Expanse, ♂ 5 to $5\frac{3}{4}$, ♀ $5\frac{3}{4}$ inches.

HABITAT.—Lower Tenasserim; Malay Peninsula; Sumatra; Banka; Billiton.

DISTRIBUTION.—Within our area, specimens were obtained by Dr. J. Anderson in

“Mergui, in December, and on Kisserang Island in January” (J. Linn. Soc. Zool. 1886, 51).

Of our illustrations on Plate 456, fig. 1 is from a Mergui male, and fig. 1a from a Malacca female.

INDO-MALAY SPECIES.—*Charus Niconicolens* (Papilio Niconicolens, Butler, Ann. Nat. Hist. 1881, p. 139. Pap. Helenus Niconicolens, Rothschild, Nov. Zool. ii. 287 (1895). *Habitat.* S. Japan; Loo Choo Isles.—*Charus Palawanicus* (Pap. Helenus var. Palawanicus, Staudinger, Iris, i. p. 278 (1888); ii. p. 12 (1889). Rothschild, *l.c.* p. 287 (1895). Pap. Helenus var. Enganius, Doherty, Journ. As. Soc. Bengal, 1891, p. 31. *Habitat.* Java; Sumatra; Nias; Engano; Borneo; Palawan.—*Charus Hystaspes* (Pap. Hystaspes, Felder, Wien. Ent. Monats. 1862, p. 283; Reise Novara, Lep. i. p. 105, pl. 15, fig. C (1865). Semper, Phil. Tagf. p. 274 (1892). *Syn.* Pap. Varasi, Reakirt, Proc. Ent. Soc. Philadelphia, 1864, p. 465. *Habitat.* Philippines.—*Charus Araspes* (Pap. Araspes, Felder, Wien. Ent. Monats. 1859, p. 321; Reise, Nov. Lep. i. p. 108, pl. 15, fig. A (1865). Semper, Phil. Tagf. p. 275. Fruhstorfer, Berl. Ent. Zeit. 1898, p. 421. *Habitat.* Borneo.—*Charus Iswaroides* (Pap. Iswaroides, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 304. *Habitat.* Battak Mountains, Sumatra.

Genus SADENGIA.

Papilio (group 7), Rothschild, Nov. Zool. ii. p. 290 (1895).

IMAGO.—Closely allied to *Charus*. *Forewing* triangular; costa arched towards the end, exterior margin slightly scalloped; outer area of the upperside not clothed with fine short hairs above the scales, as is the case in *C. Helenus* and its allied forms. *Hindwing* comparatively broader and shorter; tail shorter.

TYPE.—S. Nephelus.

SADENGIA CHAON (Plate 457, fig. 1, 1a, b, c, ♂, 1d, ♀).

Papilio Chaon, Westwood, Arcana Ent. ii. p. 97, pl. 72, fig. 1, 1a, ♂ (1845). Doubleday and Hewitson, Gen. D. Lep. i. p. 11 (1846). Gray, Catal. Lep. B. M. i. p. 18 (1852); Moore, Catal. Lep. Mus. E. I. Company, i. p. 102 (1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 320, 367. Moore, P. Z. S. 1865, p. 757. Druce, P. Z. S. 1874, p. 109. Elwes, Trans. Ent. Soc. Lond. 1888, p. 429. Manders, *id.* 1890, p. 536. Oberthür, Etud. Ent. xvii. p. 4 (1893). Rothschild, Nov. Zool. ii. p. 291 (1895).

Papilio (*Charus*) *Chaon*, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 436. de Nicéville, Sikkim Gazetteer, 1894, p. 172.

Charus Chaon, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 312.

IMAGO.—Male. Upperside fuliginous-black. *Forewing* with slender longitudinal golden-yellow scaled streaks within the cell, and broad streaks between the outer

veins uniformly extending from the base ; a short white cilia lunular point between the veins, the apical one being sometimes elongated. *Hindwing* with a large creamy-white upper-discal patch usually composed of four portions, of which the upper portion is much the shortest, and, generally, the lower portion has an attached very small more or less whitish speckled spot ; in some specimens there are golden-yellow scales scattered longitudinally between the outer interspaces of the median branches, and, in others, the outer marginal and lower discal area are sparsely speckled with similar scales. Cilia alternated slenderly with white. Underside paler. *Forewing* with grey-scaled cell streaks and golden-yellow scaled outer vein streaks, these latter streaks either uniformly occupying the outer interspaces, or, in some, are more or less restricted to the apical area, with their inner ends slightly more defined and greyish-scaled—thus slightly indicating the presence of a subapical oblique fascia ; a bluish-white constricted spot is always present obliquely placed in the submedian interspace near the posterior angle, below which is a more or less white-speckled smaller spot ; cilia white points prominent. *Hindwing* with the upper and lower basal area and the cell streaks, or the whole dark area of the wing except the tail sparsely irrorated with golden-yellow or greyish scales ; upper discal patch white, of which the four portions, as above, are sometimes smaller, these being followed by three very much smaller lower-discal spots, which latter are either quadrate, bluntly conical, or lunular in shape, placed in the median and submedian interspaces, and thus form a transverse discal interrupted band, these three last spots are either white, or the third, and in some the second and third are yellowish-ochreous, and occasionally, but very rarely, these three lower-discal small spots are absent ; beyond is a submarginal row of six yellowish-ochreous lunules and an anal lunule ; cilia lunules prominently white. *Head* and thorax black ; collar and head white spotted ; abdomen fuliginous-black with a white lateral continuous streak and a sublateral row of dots ; legs black, femora white beneath ; antennæ black.

Female. Upperside paler, dark sepia-brown ; cell and vein-streaks paler, the anterior streaks having their base slightly greyish-white scaled outside end of the cell, and thus form an ill-defined subapical oblique fascia ; the posterior streaks are also more or less slightly greyish-white scaled ; marginal cilia white points and elongated apical cilia as in the male. *Hindwing* with the dark outer area in some specimens very sparsely irrorated with golden-yellow scales ; upper-discal patch similar to the male, composed of five portions, very pale yellow, the upper portion being shorter ; cilia slenderly alternated with white. Underside. *Forewing* similar to the male, except that, on the *forewing*, the subapical greyish-white fascia is more defined than on the upperside, the white spots at the posterior angle and the marginal points are larger ; and, on the *hindwing*, the anal and submarginal yellowish-ochreous lunules are broader, the marginal cilia lunules are also somewhat

broad and tinged with yellowish-ochreous. *Abdomen* with lateral white streaks and white spots beneath.

Expanse, ♂ $3\frac{1}{2}$ to $4\frac{3}{4}$, ♀ 5 to $5\frac{1}{2}$ inches.

HABITAT.—Nepal; Sikkim; Assam; Cachar; Khasias; Burma; Shan States; Siam; Tonkin.

DISTRIBUTION.—We possess a male from Nepal, taken by the late Gen. G. Ramsay. Mr. H. J. Elwes says it is “not uncommon in the low valleys of Sikkim, and is often seen flying up and down the course of the rivers, in company with *Helenus* and many other species, from April on till October” (Tr. Ent. Soc. 1888, 429). Col. C. Swinhoe records it “common in the Khasia Hills” (Tr. Ent. Soc. 1893, 312). Mr. J. Wood-Mason obtained three males at Irangmara, Cachar, from July 25th to August 6th” (J. A. S. Bengal, 1886, 375). Col. C. H. E. Adamson says it is “widely spread throughout Burma, except in the hot plains” (List, 1897, 47). Capt. E. Y. Watson found it in the “Chin Hills, occurring rarely, in company with *Helenus*, during the dry season, January to June” (J. Bombay N. H. S. 1897, 671). Mr. Elwes records “two males from Ponekai, Tavoy” (J. A. S. Beng. 1886, 436). Dr. N. Manders found it “not so common, in the Shan States, as *Helenus*, but occurring in the same localities” (Tr. Ent. Soc. 1890, 536).

Of our illustrations on Plate 457, fig. 1 and 1a are from Pegu males, 1b, Burma male, 1c, Nepal male, and 1d, female from Sikkim.

SADENGIA PREXASPES (Plate 458, fig. 1, 1a, ♂, 1b, c, ♀).

Papilio Prexaspes, Felder, Verh. Z. B. Ges. Wien. 1864, p. 320; *id.* Reise Novara Lep. i. p. 107, pl. 15, fig. D (1865). Butler, Trans. Linn. Soc. Lond. Zool. i. p. 553 (1877). Oberthür, Etud. Ent. iv. p. 46 (1879). Wood-Mason and de Niceville, Journ. As. Soc. Bengal, 1881, p. 254, ♀. Distant, Rhop. Malay. p. 345, pl. 29, fig. 2, ♂ (1885).
Papilio fuscus Prexaspes, Rothschild, Nov. Zool. ii. p. 297 (1895).

IMAGO.—Male. Upperside fuliginous-black; cilia alternated with white. *Forewing* irrorated from the base with golden-yellow scales forming longitudinal cell and outer vein streaks; and with a posterior small broken-cluster of whitish scales before the angle. *Hindwing* with an upper-discal large creamy-white or pale yellow patch divided by the black veins, composed of four portions, and a lower contiguous very small cluster of similar coloured scales in the upper median interspace, the third portion sometimes extending to within apex of the cell; lower-discal area traversed by more or less very sparsely irrorated with lunularly-disposed golden-yellow scales, those above the anal angle being pale blue. Underside paler. *Forewing* with the irrorated cell-streaks slender, the vein-streaks being restricted medially across the outer area, decreasing in length and more or less obsolescent, or obsolete hindward, where there

is a broken grey-scaled spot before the angle. *Hindwing* with the basal area, including the cell, irrorated with golden-yellow scales; upper-discal patch whiter than above, the lower or fourth portion followed by three bluish-white lunular spots, of which the inner one is broadest, thus forming a transverse discal band, each portion of which is outwardly-bordered by a contiguous blue-scaled lunule; beyond is a submarginal row of ochreous lunules, the lower three of which are sometimes almost obliterated, a similar coloured lunule is also present above the anal angle. *Body* fuliginous; front of thorax and head black, spotted with bluish-white; abdomen with a lateral continuous white streak; legs and antennæ black; femora white beneath.

Female. Upperside paler. *Forewing* with the outer area more densely irrorated with golden-yellow scales between the veins than in the male, thus forming more-defined streaks, their inner ends from near the costa across the disc being somewhat paler and slightly greyish anteriorly, and posteriorly ending in a golden-yellow scaled spot before the angle, thus indicating an obscurely-defined transverse discal fascia. *Hindwing* similar to the male. Underside. *Forewing* paler; cell streaks slender; with a distinctly defined outwardly-recurved transverse-discal greyish-white fascia, which commences broadly beyond the cell near the costa and there radiating outward with pale golden-yellow scales between the veins, decreasing in width and nearly obliterated posteriorly, where it joins the greyish-white scaled spot before the angle. *Hindwing* similar to the male. *Abdomen* black at the sides and beneath, with a lateral and sublateral continuous white streak interspaced with a row of white dots, and a broader white longitudinal streak beneath.

Expanse, ♂ $3\frac{3}{4}$ to $4\frac{1}{2}$, ♀ 4 to $4\frac{1}{2}$ inches.

HABITAT.—S. Andamans; Cocos Island; Malay Peninsula; Borneo.

DISTRIBUTION.—Mr. J. Wood-Mason records "seven males and two females, from Port Blair, S. Andamans, taken by Mr. F. de Roepstorff" (J. As. Soc. Bengal, 1881, 254). Col. C. H. E. Adamson has a single male from Cocos Island.

Our illustration on Plate 458, figs. 1, 1a, b, c, are from Andaman male and female.

SADENGIA PITMANI (Plate 459, fig. 1, 1a, ♂).

Papilio (Laertias) Pitmani, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1886, p. 434, pl. 20, fig. 1, ♂.

Papilio Pitmani, Rothschild, Nov. Zool. i. p. 685 (1894); *id.* II. p. 343 (1895).

Male. Upperside fuliginous-black; cilia alternated with white. *Forewing* irrorated with golden scales, those within the cell forming longitudinal streaks; two small clusters of these scales being more distinct near the posterior angle. *Hindwing*

with a transverse medial-discal creamy-white macular band composed of either six, or seven, portions, the upper one shortest, the three next longest, of which the fourth is narrowest, the fifth, sixth, and seventh decreasingly smaller, the sixth and seventh being slightly tinged with ochreous and sprinkled with brown scales; in some specimens the seventh spot is indicated only by a few ochreous scales, and in others, a small deep ochreous spot is present above the anal angle; lower outer-discal area with a few scattered golden-yellow scales. Underside duller fuliginous-black. *Forewing* with the golden irrorations restricted to the cell-streaks, and outwardly, either to the apical area, or transversely decreasing hindward; two posterior greyish-white scaled quadrate spots before the angle, and in some specimens two or three smaller similar spots in the interspaces above. *Hindwing* with the basal area irrorated with golden-yellow scales; the discal macular band, as above, pure white throughout; followed by a submarginal series of seven lunules, which are partly ochreous and white, beyond which are white cilia lunules on the margin. *Body* fuliginous-black; front of thorax and head black, spotted with white; abdomen with a lateral white streak; antennæ and legs black; fore femora white beneath.

Expanse, ♂ $3\frac{1}{2}$ to $3\frac{3}{4}$ inches.

HABITAT.—Tenasserim.

DISTRIBUTION.—“Four males are recorded from Ponsekai, Tavoy” (de Nicéville, *l.c.* 434).

Our illustrations on Plate 459, fig. 1, 1a are from two males, taken at Ponsekai, Tavoy.

SADENGIA NOBLEI (Plate 459, fig. 2, 2a, ♂).

Papilio Noblei, de Nicéville, Journ. As. Soc. Bengal, 1888, p. 287, pl. 13, fig. 2, ♂; *id.* Journ. Bombay Nat. Hist. Soc. 1899, p. 335. Fruhstorfer, Deuts. Ent. Zeit. Iris, 1901, p. 268, ♀; *ib.* Berl. Ent. Zeit. 1902, p. 172, ♂ ♀. Rothschild, Nov. Zool. ii. p. 284 (1895).

Papilio Henricus, Oberthür, Etudes Ent. xvi. p. 3, pl. 4, fig. 39, ♂.

Male. Upperside fuliginous-black. *Forewing* with four slightly-apparent longitudinal cell-streaks composed of scattered ochreous scales; outer area not hairy-scaled; cilia black. *Hindwing* with a large upper-discal cream-coloured tripartite patch extending from the costal vein to the radial, of which the middle portion has its lower inner-end extending slightly within the cell; a dark red semicircle enclosing a black spot at the anal angle; cilia alternated with white. Underside. *Forewing* paler fuliginous-black; cell-streaks grey; outer veins speckled with grey scales at their extreme ends, and also at the ends of their intervening folds; a very few grey scales scattered over the discal area. *Hindwing* pale fuliginous-black basally, black exteriorly; upper discal patch as above; beyond which is a submarginal series of yellowish-ochreous lunules extending from the costa to upper median, a similar

lunule in the lower median interspace, an almost complete ring-spot at the anal angle, and above the latter an elongated pale greyish streak; a few blue scales are scattered on the lower-discal area between the submedian and radial.

Expanse, ♂, 4 inches.

HABITAT.—Burma; Tonkin.

DISTRIBUTION.—“Two males were taken in the Karen Hills, Lower Burma, in February and March” (de Nicéville, *l.c.* 287). Our description is from a male in Mr. Grose-Smith’s collection, taken by Mr. T. A. Hauxwell at Tounghoo, Upper Tenasserim, in March. Mr. de Nicéville records it from the “Katha District, Upper Burma” (J. Bombay N. H. S. 1899, 335). Both sexes were taken by Mr. H. Fruhstorfer in Middle Tonkin, who says “it is very shy, the males settle on moist sandy sheltered river banks, where they suck eagerly, but are terrified at the faintest rustle and dart suddenly upwards, to vanish among the highest branches of the trees, from whence they will not again emerge for half, or frequently a whole hour. The females never consort with the males upon the sand, but seek some secluded *Lantana* bush, where they opportunely encounter the males” (*l.c.* p. 268).

INDO-MALAY SPECIES.—*Sadengia Nephelus* (Pap. *Nephelus*, Boisduval, Spec. Gén. Lep. i. p. 210, 1836). Rothschild, Nov. Zool. ii. p. 290 (1895). *Habitat.* Celebes; Java.—*Sadengia Saturnus* (Pap. *Saturnus*, Guérin, Rev. Zool. 1840, p. 43. Staudinger, Exot. Schmett. i. p. 7, pl. 4, ♂ (1884). Distant, Rhop. Malay. p. 345, pl. 30, fig. 3, ♂, 4, 5, ♀ (1885). Pap. *Nephelus Saturnus*, Rothschild, *l.c.* p. 290 (1895). Pap. *Neptunus*, Guérin, Deless. Voy. pl. 18 (1843). Pap. *albolineatus*, Forbes, Nat. Wand. E. Arch. p. 275 (1885); Waterhouse, Aid. ii. pl. 166, fig. 1 (1886). *Habitat.* Malacca; Sumatra; Borneo.—*Sadengia Uranus* (Pap. *Uranus*, Weymer, Stett. Ent. Zeit. 1885, p. 271, ♂ ♀. Pap. *Nephelus Uranus*, Rothschild, *l.c.* p. 291 (1895). *Habitat.* Nias.—*Sadengia Nubilus* (Pap. *Nubilus*, Staudinger, Iris, 1895, p. 344. Rothschild, *l.c.* p. 291 (1895). *Habitat.* N. Borneo.—*Sadengia Diophantus* (Pap. *Diophantus*, Grose-Smith, Ent. Mo. Mag. 1883, p. 234, ♀; Rhop. Exot. Pap. p. 1, pl. 1, fig. 3, 4, ♂ (1887). Hagen, Iris, 1894, p. 22. Rothschild, *l.c.* p. 292 (1895). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 515. *Habitat.* Sumatra.—*Sadengia Chaonulus* (Pap. *Chaon*, *subsp.* *Chaonulus*, Fruhst. Soc. Ent. 1902, p. 73. *Habitat.* Hainan.—*Sadengia Hipponous* (Pap. *Hipponous*, Felder, Wien. Ent. Monats. 1862, p. 283 ♂ ♀; *id.* Nov. Reise Lep. i. p. 104, pl. 15, fig. B, ♀. Rothschild, *l.c.* p. 342). *Habitat.* Philippines.

Genus ARAMINTA.

Araminta, Moore, Journ. Linn. Soc. Zool. 1886, p. 50; Kirby, Allen’s Nat. Hist. Lep. ii. p. 292 (1896).

Papilio (part), Doubleday and Hewitson.

Papilio (Demolion group), Wallace, Trans. Linn. Soc. xxv. p. 59 (1865).

Papilio (sect. 59), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 318, 366.

Papilio (group 6, part), Rothschild, Nov. Zool. ii. p. 282 (1895).

IMAGO.—*Forewing* elongately-triangular; costa arched, exterior margin very oblique and almost even; cell long, very broad; the basal and outer dark area of the male clothed with very fine short hairs, so densely, as to conceal the scales beneath, those of the outer area being arranged somewhat in longitudinal patches. *Hindwing* short, broad, triangular; exterior margin scalloped and furnished with a lengthened spatular tail; cell more than half length of the wing. Antennæ with a lengthened slender club. Sexes similar.

LARVA.—Similar to that of *O. Erithonius*; anterior segments scutellated; furnished with two tentacular processes on the second, and two short fleshy processes on the ninth, and anal segment.

PUPA.—Curved abruptly backwards; head bifid; thorax with a lengthened curved acute thoracic process.

ARAMINTA DEMOLION (Plate 460, fig. 1, larva and pupa, 1a, b, ♂, 1c, ♀).

Papilio Demolion, Cramer, Pap. Exot. i. p. 140, pl. 89, fig. A, B (1776). Goeze, Ent. Beytr. iii. 1, p. 79 (1779). Jablonsky and Herbst, Nat. Schmett. iii. p. 199, pl. 49, fig. 1, 2 (1788). Doubleday and Hewitson, Gen. D. Lep. i. p. 13 (1846). Gray, Catal. Lep. B. M. I. p. 25 (1852). Moore, Catal. Lep. Mus. E. I. C. i. p. 105, pl. 3, fig. 5, 5a, larva and pupa (1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 138, 366. Wallace, Trans. Linn. Soc. Lond. xxv. p. 59 (1865). Butler, Catal. Lep. Fabr. B. M. p. 253 (1869). Druce, P. Z. S. Lond. 1874, p. 108. Staudinger, Exot. Schmett. i. p. 7 (1884). Kheil, Rhop. Nias, p. 37 (1884). Distant, Rhop. Malay. p. 349, pl. 27B, fig. 3, ♂ (1885). Pryer, Ann. and Mag. Nat. Hist. 1887, p. 273. Staudinger, Iris, i. p. 277 (1888). Hagen, Berl. Ent. Zeit. 1892, p. 154; *id.* Iris, vii. p. 26 (1894). Rothschild, Nov. Zool. ii. p. 282 (1895).

Araminta Demolion, Moore, Journ. Linn. Soc. Lond. Zool. 1886, p. 50.

Papilio (*Araminta*) *Demolion*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 513.

Papilio Cresphontes, Fabricius (*nec* Cramer), Spec. Ins. ii. p. 19 (1781). Horsfield, Catal. Lep. Mus. E. I. Company, pl. 3, fig. 4, 4a, larva and pupa (1828). Lucas, Lep. Exot. p. 23, pl. 15, fig. 1 (1835). Boisduval, Spec. Gén. Lep. i. p. 220 (1836). Chenu, Ency. d'Hist. Nat. Pap. pl. 1, fig. 1 (1851).

Heraclides Cresphontes, Hübner, Verz. bek. Schmett. p. 84 (1816).

IMAGO.—Male and female. Upperside fuliginous-black. *Forewing* with the basal area very sparsely irrorated with yellow scales; with an oblique transverse discal macular band, composed of a linear series of nine pale sulphur-yellow spots, extending from the posterior margin and decreasing in size to the apex; the anterior six are rounded and separated by the veins, the lower three being more quadrate in

shape and conjoined; cilia black. *Hindwing* with a transverse subbasal broader pale sulphur-yellow continuous band, extending from the costa to abdominal margin, its inner edge being almost even, the outer edge extending across the cell at some distance from its apex, and above which the edge is outwardly twice acutely angled; beyond is a submarginal series of six pale sulphur-yellow lunules, of which the two upper are much the smallest and either conical or rounded in shape; at the anal angle is a parti-coloured reddish-ochreous half-circlet enclosing a black spot, the ochreous tint being brightest in the female; above the latter is a small cluster of bluish-grey scales; cilia slenderly alternated with white. Underside. *Forewing* greyish-black, lower basal area clothed with pale yellowish-grey scales and fine short hairs; cell-streaks prominent, pale grey; transverse discal macular band, as on upperside, much paler yellow; outer veins edged with grey scales at their tips and with an intervening short grey marginal streak between the veins; the veins to near their ends pale yellow. *Hindwing* with the basal area greyish-black and densely covered with pale yellowish-grey scales; the transverse band, as on upperside, much paler yellow; apex of cell, and outer-discal area deep black between the veins; crossed by a medial-discal curved row of six bluish-grey lunules, and a submarginal bordering series of broad pale yellow lunules, of which latter the anterior and the anal ringlet and also the discal edges of the veins are tinged with bright ochreous. *Body* above fuliginous-black, beneath pale yellow; collar, head, and front yellow spotted; legs black, femora beneath pale yellow; antennæ black.

Expanse, ♂ ♀ $3\frac{3}{4}$ to $4\frac{1}{2}$ inches.

LARVA.—Similar to that of *O. Erithonius*. Anterior segments scutellated; furnished with two tentacular processes on the second segment, and two short fleshy processes on the ninth and anal segment.

PUPA.—Curved abruptly backwards; head bifid; thorax with a lengthened curved acute thoracic process.

HABITAT.—Lower Burma; Tenasserim; Siam; Malay Peninsula; Sumatra; Nias; Java; Borneo; Palawan.

DISTRIBUTION.—“Not uncommon about Tavoy in the autumn months. One specimen caught in Tounggya Sekkam, Upper Tenasserim, in February” (Col. C. H. E. Adamson, List, 1897, 48). We possess a female from Tavoy, taken in January by Mr. Tucker. Mr. T. A. Hauxwell obtained it in the Salween Valley, Upper Tenasserim, in November. A specimen from Moulmein is in the British Museum. Dr. J. Anderson took it in “Mergui, in December” (J. Linn. Soc. Zool. 1886, 50). Mr. H. Druce records it from “Chentaboon, Siam” (P. Z. S. 1874, 108). Dr. L. Martin writes, “In N.E. Sumatra it flies from March to July in the forests of the outer Hills, from Selesseh to South Bekantschan. Is rather rare in our area. The males have a quick and restless flight and frequent flowers, on which they do

not settle, but abstract the honey while hovering. The larva feeds on *Citrus*" (J. As. Soc. Bengal, 1895, 513).

Of our illustrations on Plate 460, fig. 1 is from Dr. Horsfield's Java drawings of the larva and pupa; fig. 1a, b is a male from the Salween Valley, and fig. 1c a female from Tavoy.

ARAMINTA LIOMEDON (Plate 461, fig. 1, larva and pupa, 1a, b, ♂, 1c, ♀).

Papilio Liomedon, Moore, Proc. Zool. Soc. Lond. 1874, p. 575. Hampson, Journ. As. Soc. Bengal, 1888, p. 364. Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 367, pl. D, figs. 1, 2, 3, larva and pupa. Ferguson, Journ. As. Soc. Bengal, 1891, p. 446.
Papilio Demolion Liomedon, Rothschild, Nov. Zool. ii. p. 283 (1895).

IMAGO.—Male and female. Upperside similar to *A. Demolion*, but differs, on the forewing, in all the spots, composing the transverse discal pale sulphur-yellow band, being distinctly separated from one another, and are somewhat smaller in the female. On the hindwing the pale sulphur-yellow band is placed farther from the base, with its outer edge extending beyond the cell; the submarginal lunules are somewhat larger and have more acute outer points. Underside similar to *Demolion*, but with the same differences in the band, on both wings, as on the upperside, and on the hindwing the discal black patches between the veins are shorter.

Expanse, ♂ 4, ♀ $3\frac{1}{2}$ inches.

LARVA and PUPA.—(See Plate 461.)

HABITAT.—South India.

LIFE HISTORY.—“On the 2nd of August we were on the very peak of Goodhally Hill, when one of us noticed a *P. Liomedon* flying suspiciously round a tree in very thick jungle. This was a tempting butterfly, but with a painful effort of self-control the net was laid down and the butterfly patiently tracked until, after wearisome vacillation, it settled on a tender shoot of *Acronychia laurifolia*. It remained settled for a long time, and then flew off altogether, leaving ten eggs, laid one on top of the other, as shown on the plate. On the 7th of August the caterpillars emerged, and, to minimize risk, were divided between three glass tubes, tightly corked. On August 10th a gust of wind blew one of the tubes off the table and three of the caterpillars perished, but the remaining seven thrived and were in due time transferred to a branch standing in a bottle of water. The mouth of the bottle was plugged with cotton wool, but two of them forced their way in and committed suicide. By a prompt use of the means recommended by the Humane Society for the restoration of persons apparently drowned, one was revived, but continued weakly, and was soon

after killed by ants. Five passed successfully through all dangers and became beautiful specimens, one female and four males. All through their lives these larvæ continued gregarious, dispersing occasionally to feed, but always returning to rest side by side on the upper surface of a leaf. The following dates may be interesting. Eggs laid, 2nd August; hatched, 7th August; skins cast (and eaten), 12th August; again, 17th; and again, 20th to 22nd August. The most advanced cast its skin again on the 28th of August, became a pupa on the 2nd of September, and emerged on the 15th of September. The others followed within two days. At first the larvæ were of an oily-yellow colour, and bore many pairs of spiny points, but these disappeared with age, and after the last moult there were only the short fleshy processes on the second and last segment which characterize the group, and one additional curved pair on the ninth segment. The colour after the last moult was a clear slaty-blue, changing eventually to a greenish tint, with light brown markings very much the same as those which characterize the rest of the *Erithonius* group. The pupa was more abruptly bent back from the middle of the thorax than that of *Pap. Erithonius*, and adorned on the thorax with a sword-shaped horn, fully three-eighths of an inch long, and always bent a little either to the right or left. The colour, of the pupa, was brown, or green and yellow, according to situation" (J. Davidson and E. H. Aitken, Journ. Bombay N. H. Soc. 1890, 367).

DISTRIBUTION.—"This is not a rare butterfly in Kanara, but more local than most species, owing perhaps to the larva feeding exclusively (so far as we know) on *Acronychia laurifolia*, a tree which is almost confined to the tops of wooded hills. We have met with the butterfly chiefly from August to October" (J. Davidson and E. H. Aitken, J. Bombay N. H. S. 1896, 581). The late Mr. S. N. Ward writes, "I found this butterfly only about Calicut, and reared the larva" (MS. Notes). The food-plants of the larva are *Evodia Roxburghiana* and *Acronychia laurifolia*, both of the Order Rutaceæ" (J. R. D. Bell, J. As. Soc. Beng. 1900, 258). Mr. G. F. Hampson records "two specimens obtained in September on the Western Slopes of the Nilgiris, at 2500 feet elevation" (J. As. Soc. Beng. 1888, 364). Mr. H. S. Ferguson records "six specimens taken in Travancore. Seen oftener in the low country than on the Hills, and of those taken, all but one were more or less damaged" (J. Bombay N. H. S. 1891, 446).

Of our illustrations on Plate 461, fig. 1 represents the larva and pupa copied from Mr. Ward's original drawings; fig. 1a, b from a Karwar male, and fig. 1c from a female reared at Calicut by Mr. Ward.

PHILIPPINE SPECIES.—*Araminta Antonio* (Papilio Antonio, Hewitson, Exot. Butt. v. *Pap.* pl. 14, fig. 46, ♂ (1875). Haase, Untersuch. üb. Mim. p. 39 (1893). Rothschild, Nov. Zool. ii. p. 284 (1895). *Pap.* (*Araminta*) Antonio, Semper, Phil. Tagfalt. p. 274, pl. 47, fig. 4, ♂ (1892). *Habitat.* Mindanao.

Genus LAERTIAS.

Laertias, Hübner, Verz. bek. Schmett. p. 84 (1816). Moore, Lep. of Ceylon, i. p. 150 (1881).

Papilio (sect. 60, *subsect.* a), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 318, 366.

Papilio (group H), Wallace, Trans. Linn. Soc. Zool. xxv. p. 51 (1865).

Papilio (group 18), Rothschild, Nov. Zool. ii. p. 341 (1895).

IMAGO.—Wings short, broad. *Forewing* triangular; costa arched, apex rounded. *Hindwing* convex and scalloped externally, with a more or less developed spatular tail, in both sexes, from the upper median veinlet. Cell in both wings broad. *Body* short; antennal club moderately stout. Sexes, *in the normal form*, similar. Female polymorphic; *second and third form mimics* of other Papilioninæ.

LARVA.—Smooth, glossy; attenuated posteriorly; anterior segments swollen and scutellated; twelfth segment with a pair of small pointed tubercles; front of second segment projecting, truncated, and, when irritated, it thence exserts a blood-red retractile branched tentacle emitting an offensive odour.

PUPA.—Curved anteriorly backward; head flattened and bifid in front; thorax conically pointed in front and tuberculate laterally; wing cases laterally dilated and slightly tuberculate; abdominal segments with slight dorsal tubercles.

TYPE.—*L. Pammon*.

LAERTIAS PAMMON (Plate 462, 463, 464).

Papilio Pammon,* Linnæus, Syst. Nat. ed. x. p. 460, ♂ (1758); Mus. Lud. Ulr. p. 746, ♂ (1764); Syst. Nat. ed. xii. p. 746, ♂ (1767). Clerck, Icones Ins. i. pl. 14, fig. 2, ♂ (1764). Fabricius, Syst. Ent. p. 445, ♂ (1775). Esper, Ausl. Schmett. p. 25, pl. 4, fig. 2, ♀ (1785). Boisduval, Spec. Gén. Lep. i. p. 272, ♂ ♀ (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 11 (1846). Hutton, Trans. Ent. Soc. Lond. v. p. 49 (1847). Lang, Ent. Mo. Mag. 1864, p. 101. Moore, Proc. Zool. Soc. Lond. 1865, pp. 487, 756, *id.* 1878, pp. 696, 840. Wallace, Trans. Linn. Soc. xxv. 1865, p. 51, pl. 2, fig. 1 ♂, 3 ♀. de Nicéville Journ. As. Soc. Bengal, 1885, p. 52.

Princeps Heroicus Pammon, Hübner, Samml. Exot. Schmett. i. pl. 109, fig. 1, 2 (1806-16).

Laertias Pammon, Hübner, Verz. bek. Schmett. p. 84 ♂ (1816). Moore, Proc. Zool. Soc. 1882, p. 259. Swinhoe, Proc. Zool. Soc. 1885, p. 145; *id.* 1886, p. 433.

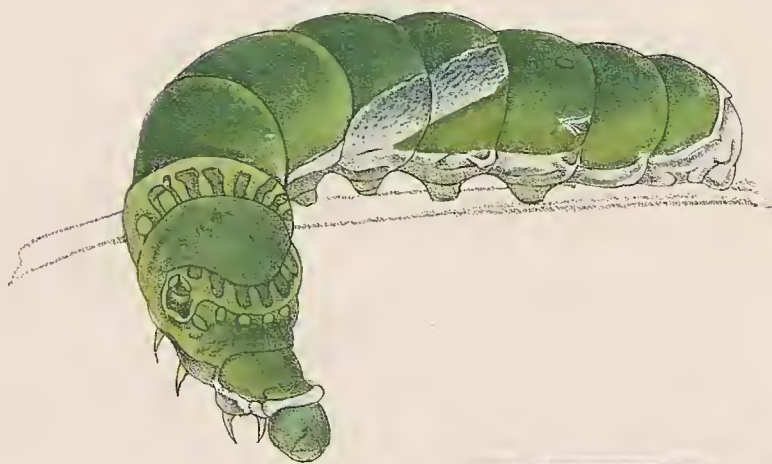
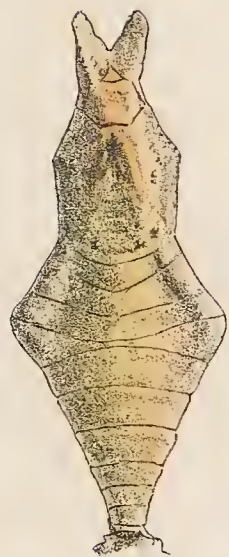
Papilio Polytes, Linnæus, Syst. Nat. ed. x. p. 460 (1758), ♀ *2nd form*; Mus. Lud. Ulr. p. 186, ♀ (1764); Syst. Nat. ed. xii. p. 746, ♀ (1767). Clerck, Icones Ins. i. pl. 14, fig. 1, ♀ (1764). Fabricius, Syst. Entom. p. 443 (1775). Sulzer, Gesch. Ins. p. 141, pl. 12, fig. 3, ♀ (1776). Cramer, Pap. Exot. iii. p. 129, pl. 265, fig. C, ♀ (1782). Jablonsky, Nat. Schmett. ii. p. 185, pl. 15, fig. 2, ♀; *id.* pl. 20, fig. 3, 4, ♀ (1775). Esper, Ausl. Schmett. p. 50, pl. 12, fig. 1, ♀ (1786). Hutton, Trans. Ent. Soc. v. p. 49, ♀ (1847). Moore, Proc. Zool. Soc. 1865, pp. 487, 756, ♀. Lang, Ent. Mo. Mag. 1864, p. 101, ♀. Wallace, Tr. Linn. Soc. Zool. 1865, p. 51, pl. 2, fig. 5, ♀. Butler, Catal. Fabr. Lep. B. M. p. 253, ♂ ♀ (1869). Druce, Proc. Zool. Soc.

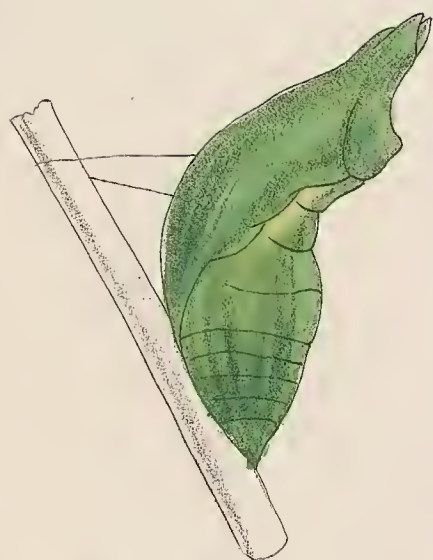
* We use *Pammon* as the proper name for this butterfly in preference to that of *Polytes*—both names appearing on the same page in Syst. Nat. *Pammon* applies to *both sexes* of the *normal form* of the species, and *Polytes* to that of one of the subsequently-developed *mimetic forms* of the female.

- 1874, p. 108, ♂ ♀. Butler, Tr. Linn. Soc. Zool. 1877, p. 552, ♂ ♀. Aurivillius, Kongl. Sv. Vet. Acad. Handl. 1882, p. 11, ♀, p. 13, ♂. Staudinger, Exot. Schmett. i. p. 7, ♂ ♀ (1884). Distant, Rhop. Malay. p. 347, pl. 33, fig. 7, ♂, 8, 9, ♀, 1st form, fig. 10, 2nd form, ♀ (1885). Elwes, Tr. Ent. Soc. 1888, p. 429, ♂ ♀. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 366, larva and pupa. Rothschild, Nov. Zool. ii. p. 343, ♂ ♀ (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 174.
- Menelaides Polytes*, Hübner, Verz. bek. Schmett. p. 85 (1816) ♀.
- Papilio (Laertias) Polytes*, Swinhoe, P. Z. S. 1884, p. 512, ♂ ♀. Doherty, Journ. As. Soc. Bengal, 1886, p. 137, ♂ ♀. Hampson, *id.* 1888, p. 363, ♂ ♀.
- Laertias Polytes*, Moore, Journ. As. Soc. Bengal, 1886, p. 51, ♂ ♀. Swinhoe, Tr. Ent. Soc. 1893, 313 ♂ ♀.
- Papilio Romulus*, Cramer, Pap. Exot. i. p. 67, pl. 43, fig. A (1776), ♀, 3rd form. Jablonsky, Nat. Schmett. ii. p. 145 (1784). Esper, Ausl. Schmett. p. 105, pl. 25, fig. 2, ♀ (1785-98). Fabricius, Spec. Ins. ii. p. 2, ♀ (1781). Doubleday and Hewitson, Gen. D. Lep. i. p. 10 (1846). Wallace, Tr. Linn. Soc. Zool. 1865, p. 52, pl. 2, fig. 6. Chaumette, Ent. Mo. Mag. 1865, p. 37.
- Menelaides Romulus*, Hübner, Verz. bek. Schmett. p. 84 (1816).
- Laertias Romulus*, Moore, Lep. of Ceylon, i. p. 150, pl. 59, fig. 1, 1a, ♂ ♀, b, c, 2nd and 3rd form, ♀ (1881).
- Papilio Mutius*, Fabricius, Ent. Syst. iii. 1, p. 3, ♀ (1793). Godart, Enc. Méth. ix. p. 70 (1819).
- Papilio Cyrus*, Fabricius, Ent. Syst. iii. 1, p. 7, ♀ 1st form (1793).
- Laertias Cyrus*, Hübner, Verz. bek. Schmett. p. 84 (1816), Samml. Exot. Schmett. ii. pl. 96, fig. 1, 2, ♀ 1st form (1820-26).
- Papilio Astyanax*, Fabricius, Ent. Syst. iii. 1, p. 13, ♀ 3rd form (1793). Donovan, Ins. of India, pl. 19, fig. 1 (1800).
- Papilio Stichius*, Hübner, Samml. Exot. Schmett. i. pl. 112, ♀ 2nd form (1806-16).
- Papilio Pammon*, var. *Nikobarus*, Felder, Verh. Z. B. Ges. Wien. 1862, p. 463; *id.* 1864, p. 319, ♂ ♀ 1st form. Moore, P. Z. S. 1877, p. 592. Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 237. de Nicéville, *id.* 1881, p. 253, *id.* 1882, p. 18.
- Papilio Polytes*, var. *Ceylanicus*, Felder, Verh. Z. B. Ges. Wien. 1864, pp. 319, 367, ♂ ♀.

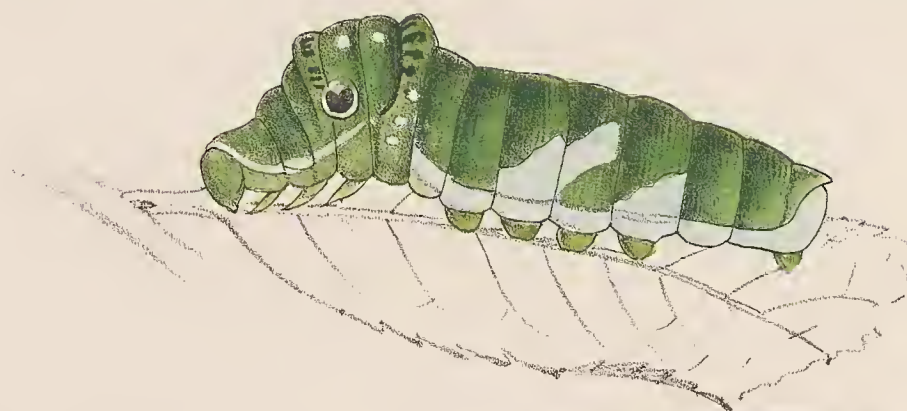
Normal Form. (Plate 462, fig. 1, larva and pupa, fig. 1a, ♂, 1b, ♀).

- Papilio Pammon*, Linn. Syst. Nat. ed. x. p. 460, ♂ (1758); *id.* ed. xii. p. 746, ♂ (1767). Mus. Lud. Ulr. p. 189, ♂ (1764). Clerck, Icones Ins. i. pl. 14, fig. 2, ♂ (1764). Fabr. Syst. Ent. p. 445, ♂ (1775). Esper, Ausl. Schmett. p. 25, pl. 4, fig. 2 (1785). Boisduval, Spec. Gén. Lep. i. p. 272, ♂ ♀ (1836). Hutton, Tr. Ent. Soc. Lond. 1847, p. 49. Lang, Ent. Mo. Mag. 1864, p. 101. Moore, P.Z.S. 1865, pp. 487, 756; *id.* 1878, pp. 696, 840. Wallace, Tr. Linn. Soc. xxv. 1865, p. 51, pl. 2, fig. 1 ♂, 3 ♀.
- Princeps Heroicus Pammon*, Hübner, Samml. Exot. Schmett. i. pl. 109, fig. 1, 2 (1806-16).
- Laertias Pammon*, Hübn. Verz. bek. Schmett. p. 84 (1816). Moore, P. Z. S. 1882, p. 259, ♂ ♀. Swinhoe, *id.* 1885, p. 145, larva and pupa; *id.* 1886, p. 433, ♂ ♀.
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- Papilio Nicobarus*, Felder, Verz. Z. B. Ges. Wien. 1864, pp. 318, 367. Moore, P. Z. S. 1877, p. 592. Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 237. de Nicéville, *id.* 1881, p. 253; *id.* 1882, p. 18.





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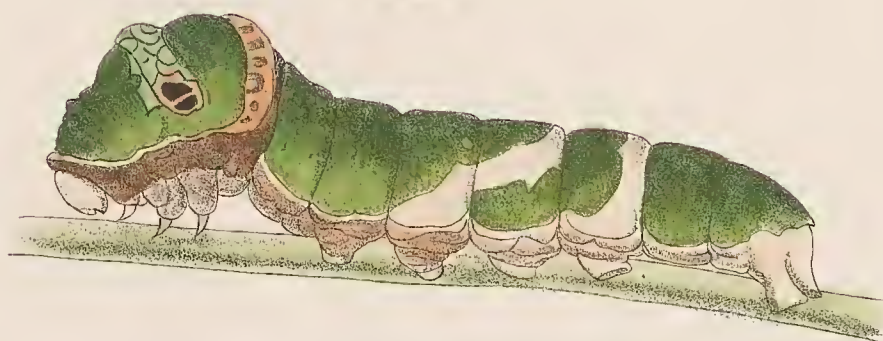
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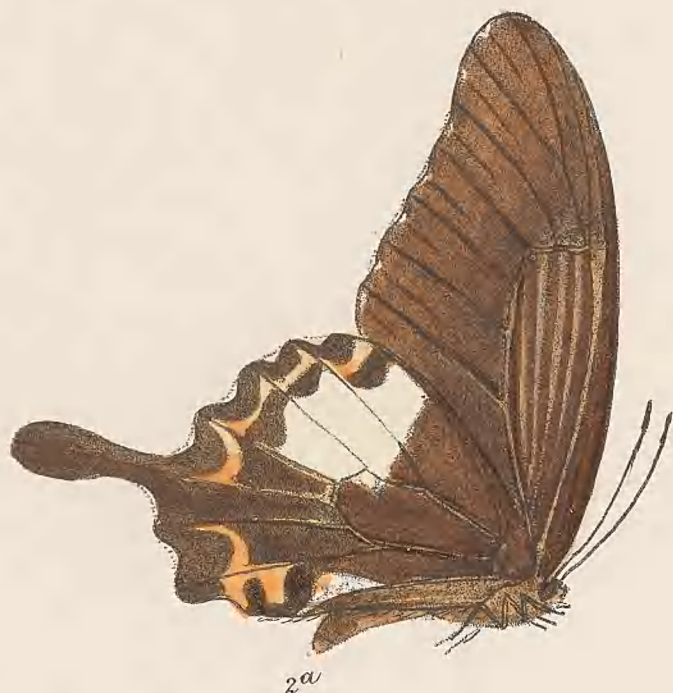
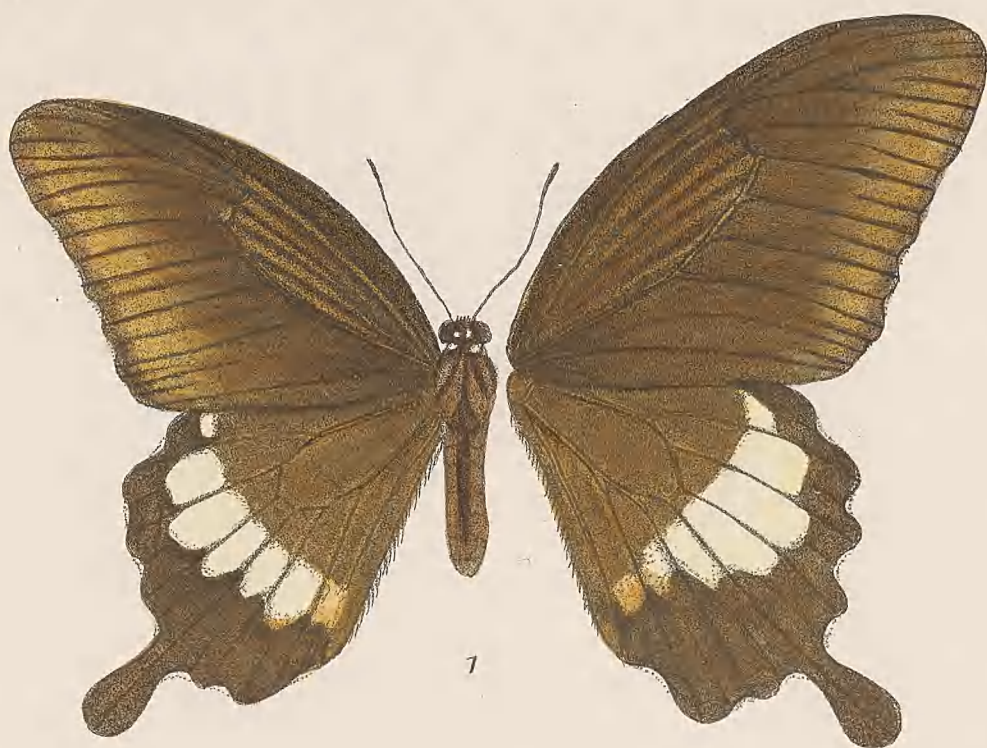


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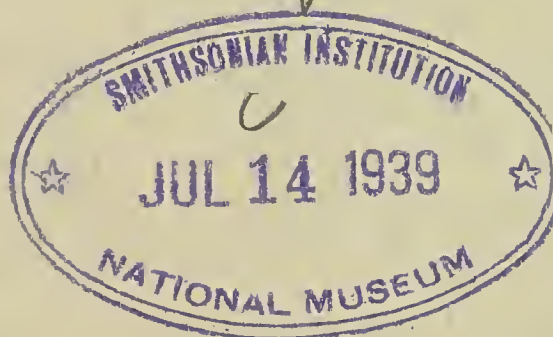
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LEPIDOPTERA INDICA.

Sub-family PAPILIONINÆ (continued).

Genus ZETIDES.

Zetides, Hübner, Verz. bek. Schmett. p. 85 (1816). Moore, Lep. of Ceylon, i. p. 144 (1881). Kirby, Allen's Nat. Hist. Butt. ii. p. 277 (1896).

Papilio (part), Doubleday and Hewitson.

Pathysa (part), Reakirt, Proc. Ent. Soc. Philad. iii. p. 503 (1864).

Papilio (sect. 27, subsect. c, d, e), Felder, Verh. Z. B. Ges. Wien. pp. 305, 350 (1864).

Papilio (group 36, pt. et 37), Rothschild, Nov. Zool. ii. pp. 429, 446 (1895).

IMAGO.—Male. *Forewing* elongatedly triangular; costa arched, exterior margin concave in the middle, slightly sinuous; cell long and broad; first subcostal branch at one-sixth before end of the cell and anastomosed to the costal, second branch at one-third between the first and end of cell; discocellulars slightly oblique, upper longest. *Hindwing* triangular, broad, short, and slightly produced hindward; exterior margin scalloped (and in some with a short blunt or slightly spatular tail); abdominal margin folded over; when open displaying a longitudinal dense woolly scent organ. *Body* woolly; antennæ comparatively short, club short and spatular. Sexes alike.

LARVA.—Smooth; anterior segments from the head to the fifth increasing in size, and then gradually tapering to the end; a pair of short pointed spines on the second and anal segment, and a pair of short nodular spines on the fourth segment.

PUPA.—Broad anteriorly; thorax with a dorsal forward-projecting frontal process.

TYPE.—*Z. Eurypylus*.

ZETIDES JASON (Plate 467, fig. 1, larva and pupa; 1a, b, ♂, 1c ♀).

Papilio Jason, Linnæus, Syst. Nat. ed. x. p. 485 (1758); *id.* ed. xii. p. 752 (1767); *id.* Mus. Lud. Ulr. p. 210 (1764). Esper, Ausl. Schmett. pl. 58, fig. 5, ♂ (1796). de Nicéville, Journ. As. Soc. Bengal, 1899, p. 224.

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Papilio Eurypylus Jason, Rothschild, Nov. Zool. ii. p. 432 (1895).

Papilio Telephus, Felder, Verh. Z. B. Ges. Wien. 1864, p. 305; *id.* Reise Novara Lep. i. p. 64 (1865).

Davidson and Aitken, Journ. Bombay N. H. Soc. 1896, p. 578.

Zetides Telephus, Moore, Lep. Ceylon, i. p. 144, pl. 63, fig. 3, ♀ (1881).

Papilio Doson, Felder, Verh. Z. B. Ges. Wien. 1864, p. 305. Davidson and Aitken, *l.c.* 1890, p. 364, pl. E, fig. 2, 2a, larva and pupa.

Zetides Doson, Moore, Lep. of Ceylon, i. p. 145, pl. 61, fig. 3, ♂ (1881).

Papilio (Zetides) Doson, Hampson, Journ. As. Soc. Beng. 1888, p. 364. Ferguson, *ib.* 1891, p. 446.

IMAGO.—Male. Upperside black. *Forewing* with three pale emerald-green slender streaks crossing inner-half of the cell, the first being brokenly continued below base of the cell, followed by a lobate outwardly-oblique spot and then a smaller triangular spot in the outer half; beyond is a transverse inner-discal macular band composed of eight spots, the upper four small, the four lower larger and increasing in size, followed by a submarginal row of nine small quadrate spots, the upper second and third being placed opposite each other in the lower subcostal interspace. *Hindwing* with a pale emerald-green transverse subbasal posteriorly-decreasing band, the upper portion of which is white, followed by a submarginal row of six small spots, quadrate in shape except the upper third, which is lunate; abdominal margin folded over, fringed with fine greyish-white hairs, the fold when opened exposing a whitish longitudinal broad streak bordering the submedian vein, and containing a dense patch of long ochreous hairs. Cilia slenderly alternated with white between the veins, those between the upper median and sub-median being also slightly inwardly-edged by a white lunule, and at the anal angle by a white spot. Underside brown; markings, as above, of a bright or dull nacreous tint, the cell-streaks and submarginal spots being larger. *Forewing* with the two lower portions of the discal band bluish-tinted. *Hindwing* with a similar coloured slender basal band and a shorter inner subbasal band extending from the costa to and joining the upper angle of the cell-portion of the broad band, the dark interspace having a short crimson streak above the costal vein; an apical cell-spot and a lower discal row of black spots outwardly bordered with crimson, extending to anal angle, the crimson colour also ascending partly up the inner edge of the sub-median vein.

Female. Upper and underside as in the male; the discal band being slightly narrower on the hindwing and with a white longitudinal streak on abdominal margin. Body greyish-black; collar and front greyish-white streaked; palpi, thorax, and abdomen beneath, lateral band, and femora beneath greyish-white; antennæ black.

Expanse, $2\frac{3}{4}$ to $3\frac{1}{2}$ inches.

LARVA.—“Smooth; anterior segments from the head to fifth increasing in size and then decreasing more gradually to the end; second and anal segment with a

pair of short pointed spines, and also a dorsal pair of short blunt nodular spines—each encircled at the base by a black ring—on the fourth segment. Colour generally black, or smoky, until the last moult, and then dull green, inclining to rusty-brown on the sides; some remain quite black to the end.”

PUPA.—“Broad anteriorly; thorax with a dorsal forward-projecting frontal process. Colour normally green, but varies with that of the object to which it is attached” (Davidson and Aitken, *l.c.*).

HABITAT.—Ceylon; South India.

DISTRIBUTION, HABITS, ETC.—“Very abundant in Ceylon, in July, August, and at the end of the year in the north and eastern portions in the low country. On November 16th, 1898, on the first day of the annual flight, Dr. N. Manders noted that it was migrating in large numbers at Colombo; nearly all the numerous specimens he captured were in more or less tattered condition though freshly emerged, showing that they had flown a considerable distance; they probably came from the dry district of Hambantota on the south-eastern side of the island” (L. de Nicéville, J. As. Soc. Beng. 1899, 224). “The larva feeds on *Unona Lawii* and on *Saccopetalum tomentosum*, Order Anonaceæ” (*id. l.c.* 1900, 257). Mr. F. M. Mackwood obtained it in the “low country, and principally in the northern province. Capt. Wade found it common in Kandy, and Galle. Capt. Hutchison took it in the eastern province, in forest ground, in August. Also on the Trincomali road. It sits in crowds on wet places; have covered forty or fifty at once with my net. Very rare elsewhere” (Lep. Ceylon, i. pp. 144, 145). In South India “this species may be found in the Kanara district of Bombay, wherever *Pap. Teredon* occurs in this district, though it does not occur further north. It is quite a thirsty creature, and usually contributes to the crowd that collects about moist ground in open places in the forest, but it is scarcely so numerous as *Teredon*. We have met with three specimens of this butterfly in which the green of the upperside was replaced by a pale straw yellow. We found the larva of this butterfly at Karwar, in June and July, feeding on two trees of the Order Anonaceæ, along with the larva of *Pap. Nomius* and *Agamemnon*. Some remained in the pupa state for nearly two months. At first sight the larva is very like that of *P. Agamemnon*, but the second pair of spines is entirely wanting, and the third pair is reduced to mere knobs, encircled by a black ring; the colour is generally black, or smoky, until the last moult, and then dull green, inclining to rusty-brown on the sides; but some of our specimens remained quite black to the end. The pupa has the frontal process straight, but directed forward; its colour is normally green, but varies with that of the object to which it is attached; one, attached to white cloth, was almost pure white” (J. Davidson and E. H. Aitken, Journ. Bombay N. H. Soc. 1890, 364, *id.* 1896, 578). The late Mr. S. N. Ward obtained it in “Malabar and Kanara, above and below the

Ghâts. The larva bred. Also taken on the Nilgiris" (MS. Notes). Mr. G. F. Hampson records it as "rather rare on the Nilgiris, from 1,000 to 6,000 feet elevation" (J. As. Soc. Bengal, 1888, 364). Mr. H. S. Ferguson says it is "not common in Travancore; found only on the Hills from 2,000 feet upwards" (J. Bombay N. H. Soc. 1891, 446).

Of our illustrations on Plate 467, fig. 1 is from Mr. Ward's Malabar drawing of the larva and pupa, and figs. 1a, b, c from Ceylon, male and female.

ZETIDES AXION (Plate 468, fig. 1, *larva* and *pupa*; 1a, b, c, d, ♂, 1e ♀).

- Papilio Axion*, Felder, Verh. Z. B. Ges. Wien. 1864, pp. 305, 350. Moore, P. Z. S. 1878, p. 697.
Zetides Axion, Moore, P. Z. S. 1882, p. 257.
Papilio (Zetides) Axion, Doherty, Journ. As. Soc. Bengal, 1886, p. 136.
Papilio Eurypylus Axion, Rothschild, Nov. Zool. ii. pp. 433, 504 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 204.
Zetides Eurypylus, Hübner, Samml. Exot. Schmett. ii. pl. 107, fig. 1, 2 (1802 26). Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 314.
Papilio Eurypylus, Moore, Catal. Lep. Mus. E. I. C. I. p. 113, pl. 12, fig. 10, 10a, *larva* and *pupa* (1857). Wood-Mason, Journ. As. Soc. Beng. (1880), p. 238; *ib.* (1881), p. 253. Elwes, Tr. Ent. Soc. Lond. 1888, p. 435. Watson, Journ. Bombay N. H. Soc. 1891, p. 53. Röbbbe, Ann. Soc. Ent. Belg. 1892, p. 126. Oberthür, Et. Ent. xvii. p. 4 (1893).
Papilio (Zetides) Eurypylus, Wood-Mason, J. As. Soc. Beng. 1886, p. 375. de Nicéville, Sikkim Gaz. 1894, p. 174, *id.* J. As. Soc. Beng. 1895, p. 525.
Papilio Jason, Wallace, Tr. Linn. Soc. xxv. p. 66 (1865). Moore, P. Z. S. 1865, p. 757. Piepers, Tijds. v. Ent. 1876, p. 155; *id.* 1888, p. 347, pl. 8, fig. 1-3, *larva*. Honrath, Berl. Ent. Zeit. 1884, p. 396. Staudinger, Ex. Schmett. i. p. 9 (1884). Snellen, Mid. Sumatra, ii. p. 25 (1892).
Papilio Jason, var. *Evemonides*, Honrath, Berl. Ent. Zeit. 1884, p. 396, pl. 10, fig. 2.
Papilio Doson, Rothney, Ent. Mo. Mag. 1882, p. 33. de Nicéville, J. As. Soc. Beng. 1885, p. 51. Butler, Ann. Nat. Hist. 1885, p. 342.
Papilio Telephus, Distant, Rhop. Malay. p. 361, fig. 109 (1885). Weymer, Stett. Ent. Zeit. 1885, p. 273. Holland, Tr. Amer. Ent. Soc. 1887, p. 122. Hagen, Berl. Ent. Zeit. 1892, p. 155; *id.* Iris. 1894, p. 28.
Papilio (Zetides) Telephus, Elwes and de Nicéville, J. As. Soc. Beng. 1886, p. 437.
Papilio Jason, var. *Telephus*, Staudinger, Iris, 1889, p. 16.
Papilio Acheron, Moore, Ann. Nat. Hist. 1885, p. 120. Butler, *ib.* 1885, p. 342.
Papilio Eurypylus Axion, aber. *Acheron*, Rothschild, Nov. Zool. ii. pp. 434, 504 (1895).
Papilio Mecisteus, Distant, Rhop. Malay. p. 361, fig. 108 (1885).
Papilio Eurypylus Acheron et *Cheronus*, Fruhstorfer, Berl. Ent. Zeit. 1902, p. 203-4.

IMAGO.—Male. Upperside similar to *Z. Jason*. Forewing with the pale emerald-green cell-streaks and lower basal streak broader, the discal transverse macular band composed of larger and longer posterior portions, and the submarginal spots also larger. Hindwing with the transverse band also broader, the subbasal short white costal-streak of the underside being more or less apparent, or frequently well-

defined, and is then joined to the upper angle of the cell portion of the band; the submarginal spots also larger; abdominal margin fringed with long fine greyish-white hairs, the fold when open displaying a longitudinal broad whitish streak, bordering the submedian, containing a patch of fine long ochreous hairs. Underside brown, with similar markings of a bright or dull nacreous tint, the cell-streaks and submarginal spots being much larger. *Forewing* with the pair of upper submarginal spots sometimes united. *Hindwing* with the white subbasal costal streak either disconnected or united to the upper angle of the cell portion of the band, and the black of the apical cell-spot occasionally extending inward below the base of the lower subcostal veinlet, and occasionally there are two black apical cells-spots divided by the crimson lunule, the outer one being small; the crimson outer discal lunules are more intense.

Female.—Upperside with the cell streaks, and transverse band on both wings narrower than in male. *Hindwing* with the subbasal costal streak ill-defined, the abdominal border with a longitudinal whitish band. Underside with similar larger cell-streaks and submarginal spots as in male, the transverse band on both wings as on upperside, the abdominal margin with a longitudinal white band.

Expanse, ♂ 3 to $3\frac{1}{2}$, ♀ $3\frac{1}{4}$ to $3\frac{1}{2}$ inches.

LARVA and PUPA.—Similar to *Z. Jason*. (See Plate 468.)

HABITAT.—N. Western and Eastern India; Sikkim; Lower and Eastern Bengal; Assam; Burma; Shan States; Siam; Tenasserim; Malay Peninsula; Andamans; Sumatra; Nias; Banka; Billiton; Java; Borneo; Balabac; Palawan; Hainan; Tonkin.

DISTRIBUTION, ETC.—Mr. W. Doherty records “one male, taken at Askot, E. Kumaon, at 5,000 feet elevation” (J. As. Soc. Beng. 1886, 136). Mr. J. H. Hocking took it in the Kangra District (P. Z. S. 1882, 257). Mr. H. J. Elwes found it “common in the low valleys of Sikkim from April to October” (Tr. Ent. Soc. 1888, 435). It also occurs in Bhotan. Col. C. Swinhoe has received “several examples from the Khasia Hills” (Tr. Ent. Soc. 1893, 314). Mr. J. Wood-Mason obtained “eleven males and one female in the forests around Silcuri, Cachar, from May 6th to August 8th” (J. As. Soc. Beng. 1888, 375). Dr. G. Watt took it near Manipur (Ann. Nat. Hist. 1885, 342). Mr. L. de Nicéville says it “appears in Calcutta in March, and specimens may be met with throughout the summer, but the spring brood is the largest. The larva feeds on the young leaves of *Polyalthia longifolia*” (J. As. Soc. Beng. 1885, 51). Mr. J. Rothney found it “rather uncommon in Barrackpur, near Calcutta. It frequents the flowers of *Durandtia Plumieri*” (Ent. Mo. Mag. 1882, 33). Mr. A. Grote found the “larva, in Calcutta, feeding on *Michelia Champa* and *Uvaria longifolia*” (MS. Notes). Mr. W. C. Taylor records it as “not very common at Khorda, in Orissa” (List, p. 16). Col. C. H. E.

Adamson says "males are very common throughout Burma. From April to October they frequent beds of streams, flying up and down the same with great rapidity" (List. of Burm. Butt. 1897, 49). Lieut. E. Y. Watson found it "common at Beeling" (J. Bombay, N. H. S. 1888, 26). "A single specimen was taken at Tilin in February, and another at Choungkwa in May" (*id. l.c.* 1891, 54). It was found "not uncommon at the foot of the N. Chin Hills, in May" (*id. l.c.* 1897, 672). Mr. de Nicéville also records it from "Chin Lushai, March; and Lamtok in April" (*l.c.* 1890, 6). Mr. H. J. Elwes records "numerous males, but no females, from Ponsekai and the Hills, Tavoy" (J. As. Soc. Beng. 1886, 437). Mr. F. de Roepstorff obtained it at "Port Blair, S. Andamans" (P. Z. S. 1877, 593, J. As. Soc. Beng. 1880, 238).

Of our illustrations on Plate 468, fig. 1, *larva* and *pupa*, are from Mr. A. Grote's Calcutta drawings; figs. 1, a, b, from Sikkim males; fig. 3, a Sikkim male; 1d, from the male type of *Acheron*, and 1e, from a Calcutta female.

ZETIDES CHIRON (Plate 469, fig. 1, 1a ♂, 1b, c, ♀).

Papilio Chiron, Wallace, Trans. Linn. Soc. xxv. p. 66 (1865). Moore, Proc. Zool. Soc. 1865, p. 757.

Honrath, Berl. Ent. Zeit. 1884, p. 397. Staudinger, Exot. Schmett. i. p. 9 (1884).

Papilio Bathycles, var. *Chiron*, Elwes, Trans. Ent. Soc. Lond. 1888, p. 436.

Papilio Bathycles Chiron, Rothschild, Nov. Zool. ii. p. 438 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 207.

Papilio Bathycles, Moore, Catal. Lep. Mus. E. I. C. i. p. 114 (1857). Butler, Ann. Nat. Hist. 1885, p. 343. Manders, Tr. Ent. Soc. Lond. 1890, p. 536.

Zetides Bathycles, Swinhoe, Tr. Ent. Soc. Lond. 1893, p. 314.

Papilio (Zetides) Bathycles, de Nicéville, Sikkim Gazetteer, 1894, p. 175.

Papilio Chiron, var. *Chironides*, Honrath, Berl. Ent. Zeit. 1884, p. 397, pl. 10, fig. 4. Fruhstorfer, Deuts. Ent. Zeit. 1901, p. 346; *ib.* Berl. Ent. Zeit. 1902, p. 207.

IMAGO.—Male. Upperside black. *Forewing* with four pale emerald-green cell-streaks and a small spot at its end, a smaller less-apparent streak also below base of the cell, a transverse inner-discal oblique macular band of eight spots, the upper three being small, the lower five increasing posteriorly in size and length, followed by a submarginal row of small mostly quadrate spots. Cilia black. *Hindwing* with a pale emerald-green transverse subbasal posteriorly-decreasing band, which is broadly intersected by black-bordered veins, the two costal portions being white; sometimes there is also a dot or a very small contiguous spot in the upper median interspace; beyond is a submarginal row of mostly-quadrate spots; abdominal margin broadly white, the scent-organ absent. Cilial lunules slenderly white. Underside sepia-brown, with similar markings, as on upperside, of a bright nacreous tint, the cell-streaks and submarginal spots being much larger. *Forewing* with the

apical markings flushed with olivaceous-ochreous. *Hindwing* with the basal markings flushed with olivaceous-yellow, in some a very small bright ochreous-yellow spot is present between the two costal portions; a lower-discal row of bright ochreous-yellow spots; abdominal border white. *Head* and front of thorax black, spotted with white; sides of thorax clothed with fine grey hairs; abdomen above greyish-brown, beneath white with a lateral longitudinal brown stripe; thorax beneath, and palpi white; legs black above, white beneath; antennæ black.

Female. Upper and underside similar to the male.

Expanse, ♂ 3 to $3\frac{1}{2}$ inches; ♀ $3\frac{1}{2}$ inches.

HABITAT.—Sikkim; Assam; Burma; Shan States; Annam; Tonkin.

DISTRIBUTION.—The late Mr. W. S. Atkinson notes that this species is "not uncommon in Sikkim and the Khasias" (MS. Notes). Mr. H. J. Elwes says "the male is not uncommon, in Sikkim, at from 2,000 to 3,000 feet elevation, from April to October; but I have never seen a female" (Tr. Ent. Soc. 1888, 436). We possess specimens from Nepal, taken by Gen. G. Ramsay; from Sikkim; the Shan States, Siam, taken by Mr. J. Roberts, C.E., and also from Tavoy. Col. C. Swinhoe records "many examples, from the Khasia Hills" (Tr. Ent. Soc. 1893, 314). Col. C. H. E. Adamson says "this insect is by no means common in Burma; I have taken it in Tenasserim and near Bhamo" (List, 1897, 49). Capt. E. Y. Watson records "three specimens obtained at the foot of the North Chin Hills, in May" (J. Bombay N. H. S. 1897, 672).

ZETIDES AGAMEMNON (Plate 470, fig. 1, *larva* and *pupa*, 1a, b, ♂, 1c, ♀).

Papilio Agamemnon, Linnæus, Syst. Nat. ed. x. p. 462 (1758); *id.* ed. xii. p. 748 (1767); *id.* Mus. Lud. Ulr. p. 202 (1764). Fabricius, Syst. Ent. p. 455 (1775). Jablonsky and Herbst, Nat. Schmett. iii. p. 192, pl. 48, fig. 1, 2 (1788). Römer, Gen. Ins. Linn. p. 68, pl. 13, fig. 3 (1789). Esper, Ausl. Schmett. p. 183, pl. 46, fig. 1, 3 (1796). Donovan, Ins. of China, pl. 27, fig. 2 (1798). Boisd. Spec. Gén. Lep. i. p. 230 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 14 (1846). Gray, Catal. Lep. B. M. i. p. 27 (1852). Moore, Catal. Lep. Mus. E. I. C. i. p. 114, pl. 3, fig. 9, 9a, *larva* and *pupa* (1857). Wallace, Trans. Linn. Soc. xxv. p. 67 (1865). Moore, P. Z. S. 1865, p. 757. Semper, Verh. Z. B. Ges. Wien. (1867), p. 698. Druce, P. Z. S. 1874, p. 108. Butler, Tr. Linn. Soc. Zool. 1877, p. 552. Moore, P. Z. S. 1877, p. 592, *id.* 1878, p. 841. Wood-Mason, Journ. As. Soc. Bengal, 1880, p. 238, *id. l.c.* 1881, pp. 237, 253; *id.* 1882, p. 18. Dewitz, Nov. Acta Ac. Nat. 1882, p. 265, pl. 2, fig. 4, 4a, b, *larva* and *pupa*, Staudinger, Exot. Schmett. i. p. 9, pl. 6 ♂ (1884). Kheil, Rhop. Nias, p. 37 (1884). Butler, Ann. Nat. Hist. 1885, p. 343. Distant, Rhop. Malay. p. 363, pl. 32, fig. 7 (1885); *id.* Ann. Nat. Hist. 1887, p. 274. Holland, Trans. Amer. Ent. Soc. 1887, p. 122. Piepers, Tijds. v. Ent. 1888, p. 341, pl. 7, fig. 1-7, *larva* and *pupa*. Elwes, Tr. Ent. Soc. Lond. 1888, p. 437. Staudinger, Iris, ii. p. 16 (1889). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 363. Hagen, Deuts. Ent. Zeit. 1891, p. 155; *ib.* Iris, 1894, p. 28. Snelling, Mid. Sumatra, ii. p. 25 (1892). Rothschild, Nov. Zool. ii. p. 447 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 217.

Iphiclides Agamemnon, Hübner, Verz. bek. Schmett. p. 82 (1816).

Aërnauta Agamemnon, Berge, Schmett. p. 108, pl. 34, fig. 5 (1842).

Zetides Agamemnon, Moore, Lep. of Ceylon, i. p. 145, pl. 63, fig. 2, ♂, 2a, larva (1881). *id.* Journ. Linn. Soc. Zool. 1886, p. 50. Swinhoe, P. Z. S. 1885, p. 145; *id.* Tr. Ent. Soc. Lond. 1893, p. 314.

Papilio (Zetides) Agamemnon, Doherty, Journ. As. Soc. Bengal, 1886, p. 136. Wood-Mason, *ib.* 1886, p. 375; Elwes, *ib.* 1886, p. 437. Hampson, *ib.* 1888, p. 364. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446. de Nicéville, Sikkim Gaz. 1894, p. 175; *id.* Journ. As. Soc. Bengal, 1895, p. 527.

Papilio Agamemnon, var. *Snellen*, Tijds. v. Ent. 1894, p. 71, pl. 3, fig. 3.

Papilio Agamemnon, var. *rufescens*, Oberthür, Etud. Ent. iv. p. 58 (1879).

Papilio Agamemnon, var. *decoratus*, Rothschild, Nov. Zool. ii. p. 452 (1895).

Papilio Agamemnon, subsp. *rufoplenus*, Fruhstorfer, Berl. Ent. Zeit. 1898, p. 310.

Papilio Dorylas, Sulzer, Gesch. Ins. pl. 13, fig. 3 (1776).

Papilio Ægistus, Cramer, Pap. Exot. ii. p. 15, pl. 106, fig. C, D (1776).

IMAGO.—Male. Upperside olivescient-black. *Forewing* with a bright olive-green transverse basal stripe, a stripe crossing base of the cell, three equidistant short pairs across its middle and a short one before the apex, two small spots beyond end of the cell, an oblique discal series of seven spots, the upper two small, the second outwardly placed, the others gradually increasing in size, followed below by three outwardly-oblique spots and a parallel subbasal stripe cut by the submedian vein; beyond is a submarginal row of nine small spots. *Hindwing* with a bright olive-green basal stripe, a subbasal broken stripe extending broadly from the costa and obliquely narrower across the cell, and thence inwardly within the lower median interspace, followed by a transverse discal curved series of six spots decreasing in size posteriorly, the upper or costal spot being large and white, and then a submarginal row of irregularly-lunate spots, the four lower being narrow and the upper one white; abdominal fold greyish-white, sometimes greenish, when open displaying a greyish-ochreous woolly scent patch. Cilia slenderly greyish-white. Underside pale purplish-brown, clouded with dark olive-brown patches. *Forewing* with the olive-green markings as on upperside, but less prominent, the submarginal more or less obscured by brown scales, those in the lower median and submedian interspaces almost white-scaled, and the discal spots have their exterior portion densely covered with white scales. *Hindwing* with similar disposed markings as on upperside, the basal and the upper part of subbasal stripe—from the costal to partly across the cell—being olive-green, the lower portion of the latter, the lower four discal spots, and the submarginal spots being obscured by brown scales; the fifth discal spot is small, round, and very pale green, the upper discal or costal spot is broad and either greyish-white or pinkish-white, both these latter being inwardly margined with a pink-bordered black lunule; a small black spot above anal angle preceded by a reddish spot, both being bordered with greyish or black scales. Tails of males

variable in length, frequently short, of females slightly spatulate. *Body* above olivescence-black, the sides of abdomen brown; collar and thorax laterally margined with olive-green hairs and the abdomen with grey scales; a red hairy spot behind the eyes; palpi white, tipt with red hairs; body beneath pinkish-grey; legs above blackish, beneath greyish; antennæ black.

Female. Upperside similar to the male. *Hindwing* with a whitish or greenish abdominal stripe. Underside similar to the male.

Expanse, ♂ 3 to 4, ♀ $3\frac{1}{2}$ to 4 inches.

LARVA.—"Smooth. From the head, which is moderately large, the anterior segments increase in thickness to the fourth or fifth and then gradually decrease to the tail; there are four pairs of spines, one pair on the second segment, another pair on the fourth, the latter rather long, curved, and sharp, a short pair on the third, and a pair on the anal segment. Colour at first smoky-black, but at the last moult becomes a light, clear green, faintly marked with wavy lines of a darker shade."

PUPA.—"Smooth and regular, with a pointed process rising from the thorax above the head; it is normally of a pale watery-green, the frontal process being broadly tipt with rusty-brown, which continues in an irregular line along the outside edge of the wing-cases" (Davidson and Aitken, *l.c.* 1890, 363).

HABITAT.—N.W. and E. and S. India; Ceylon; Andaman and Nicobar Isles; Burma; Tenasserim; Siam; Tonkin; Malay Peninsula; Sumatra; Nias; Java; Borneo; Natuna; Palawan; Philippines; Hainan.

HABITS OF LARVA AND IMAGO.—"The larvæ are extremely shy and cautious, resting motionless most of the day on the upperside of a leaf, along the midrib, with their heads towards the stalk. The leaf on which they rest is usually carpeted with silk; they eat little and grow slowly. They feed on the Custard-Apple (*Anona squamosa*), the 'Ramphul' (*Anona reticulata*), and others of the genus, and also on the 'Ashok' (*Gualteria longifolia*). It is often difficult to find, and must be looked for on the less exposed leaves of trees in quiet, shady places. The season is from July till November. We do not remember having found it at any other time. The butterfly is pretty common everywhere in the North Kanara District of Bombay, frequenting gardens and forests. In the former the larvæ feeds chiefly on the Custard-Apple, and in the latter on several trees of the same Order. The larvæ appear in June, and again more abundantly three months later, at which time the butterfly is most common, but it may be met with every month of the year" (Davidson and Aitken, *l.c.* 1890, 363; *id.* 1896, 578). Mr. de Nicéville records the food-plants of the larva, as "*Unona discolor*, *Polyalthia longifolia*, *Anona squamosa*, *A. reticulata*, and *Saccopetalum tomentosum*, all of the Order Anonaceæ" (J. As. Soc. Beng. 1900, 257).

DISTRIBUTION, HABITS, ETC.—In N. Western India, Mr. W. Doherty obtained it

in the "Lower Gori, Kumaon, at 2,500 feet elevation. Scarce" (J. As. Soc. Beng. 1886, 136). We possess specimens from Nepal, taken by the late Gen. G. Ramsay. Mr. H. J. Elwes found it "common in Sikkim up to 3,000 feet elevation, from April to December" (Tr. Ent. Soc. 1888, 437). Mr. L. de Nicéville says it is "common in Sikkim at low elevations throughout the year" (Sikkim Gaz. 1894, 175). Mr. J. Wood-Mason records "ten males and three females, taken in forests around Silcurei, Cachar, from May 12th to August 5th" (J. As. Soc. Beng. 1886, 375). Col. C. Swinhoe records it from the "Khasia Hills" (Tr. Ent. Soc. 1893, 314). In Southern India it was obtained by Mr. S. N. Ward, in "Malabar and Kanara, above and below the Ghâts, and in the Nilgiris" (MS. Notes). Messrs. J. Davidson and E. H. Aitken obtained the larvæ and butterfly in the N. Kanara District of Bombay, the larvæ appearing in June, and again more abundantly three months later, at which time the butterfly is most common, but it may be met with every month of the year" (J. Bombay N. H. S. 1896, 578). Mr. G. F. Hampson obtained it on the "Nilgiris, from 1,000 to 7,000 feet elevation" (J. A. Soc. Beng. 1888, 364). It is "very common in the low country and hills of Travancore" (H. S. Ferguson, J. Bombay N. H. S. 1891, 446). Lieut. E. Y. Watson records it as "the commonest butterfly in Madras, from March to August" (J. As. Soc. Beng. 1890, 268). In Ceylon the larva is stated, by Dr. Thwaites, to feed on Magnoliaceæ and Anonaceæ. Mr. F. M. Mackwood found the butterfly in fair numbers, both in low country and above 4,000 feet elevation, all through the year. The larva feeding on Soursop (*Anona*) and Cinnamon" (Lep. Ceylon, i. 145). Dr. N. Manders says it is "usually common and frequently very abundant in Ceylon, especially in the low country and lower hill districts, and is given to migrating" (J. As. Soc. Beng. 1899, 224). Prof. R. Meldola obtained it in "Kamorta, Nicobars, in April, and Mr. F. de Roepstorff at Port Blair, S. Andamans" (P. Z. S. 1877, 592). In Burma it is found "throughout the country, except in the central Plains. It frequents gardens, and the larva is easily found" (Col. C. H. E. Adamson, List, 1897, 49). Mr. O. Limborg obtained it on the road from "Moulmein to Meetan; Hatseiga; and Houngduran Source" (P. Z. S. 1878, 841). Signor L. Fea took it at "Shwegoomyo in October, and at Bhamo in November" (MS. Note). Capt. E. Y. Watson obtained "a single specimen in the N. Chin Hills, at 3,500 feet elevation, in the rainy season" (J. Bombay N. H. S. 1897, 672). Mr. H. J. Elwes records "a few males from Ponsekai, Tavoy, and the Hills on the Siam frontier" (J. As. Soc. Beng. 1886, 437). Dr. J. Anderson obtained it in "Mergui in December, Zediwon in December, on Sullivan Island in January, and on Elphinstone Island in March" (J. Linn. Soc. Zool. 1886, 50). Dr. L. Martin writes, "It is common, in N.E. Sumatra, throughout the year, everywhere in the plains where *Anona muricata* and *Michelia champaca*, the food-plants of the larvæ, are found, and frequents the flowers of the *Lantana*, etc., in

gardens and near houses. As the butterfly is found also in the forest, some wild species of *Anonaceæ* or an allied plant for the larva to feed on must grow there. The full-fed larva exists in two varieties, a bright transparent shining green form, and a yellow form, both having on the first three segments (omitting the head) a horny tubercle with orange base on each side of each segment. After fifteen days the imago emerges from the pupa. The female butterfly prefers young low plants of the *Anona* on which to lay her eggs, as on young newly-planted bushes four or five caterpillars are often found together" (J. As. Soc. Beng. 1895, 527).

INDO-MALAYAN SPECIES.—*Zetides Gordion* (Papilio Gordion, Felder, Verh. Z. B. Ges. Wien. 1864, p. 305; *id.* Reise Nov. Lep. i. p. 66 (1865). Pap. Eurypylus Gordion, Rothschild, Nov. Zool. ii. p. 435 (1895). *Habitat.* Philippines.—*Zetides Mikado* (Pap. Mikado, Leech, P. Z. S. 1837, p. 406, pl. 35, fig. 1, ♀; Butt. of China, etc., p. 526, pl. 32, fig. 6 (1893). Pap. Eurypylus Mikado, Rothschild, *l.c.* p. 435. *Habitat.* S. Japan.—*Zetides Evemon* (Pap. Evemon, Boisd. Spéc. Gén. Lep. i. p. 234 (1836). Distant, Rhop. Malay. p. 360, pl. 32, fig. 1 (1885). Rothschild, *l.c.* p. 436. Fruhst. Berl. Ent. Zeit. 1902, p. 206. Pap. Jason, *var.* Evemon, Staudinger, Exot. Schmett. i. p. 9, pl. 6, ♂ (1884). *Habitat.* Malacca; Sumatra; Java; Borneo.—*Zetides albociliatus* (Pap. Evemon *subsp.* albociliatus, Fruhstorfer, Soc. Ent. 1901, p. 177; *id.* Berl. Ent. Zeit. 1902, p. 205. *Habitat.* Tonkin.—*Zetides Igneolus* (Pap. Evemon *subsp.* Igneolus, Fruhst. Soc. Ent. 1901, p. 90. *Habitat.* Nias.—*Zetides Procles* (Pap. Procles, Grose-Smith, Ann. N. H. 1887, p. 433; *id.* Rhop. Exot. i. Pap. p. 13, pl. 6, fig. 1, 2, ♂ (1888). Rothschild, *l.c.* p. 436. *Habitat.* N. Borneo.—*Zetides Leechi* (Pap. Leechi, Rothschild, Nov. Zool. ii. p. 437, ♂ (1895). P. Bathycles, Leech, Butt. of China, etc., p. 525. *Habitat.* China.—*Zetides Bathycles* (Pap. Bathycles, Zinken, Nov. Acta Acad. N. C. 1831, p. 157, pl. 14, figs. 6, 7, ♂. Guerin, in Belanger's Voy. Zool. p. 505, pl. 5, fig. 1, 1a (1834). Boisd. Spéc. Gén. Lep. i. p. 232. Rothschild, *l.c.* p. 437. *Habitat.* Java.—*Zetides Bathycloides* (Pap. Bathycles *var.* Bathycloides, Honrath, Berl. Ent. Zeit. 1884, p. 396, pl. 10, fig. 3 (1884). Semper, Phil. Tagfalt, p. 283 (1892). Rothschild, *l.c.* p. 438. P. Bathycles, Distant, Rhop. Malay. p. 362, pl. 32, fig. 2, ♂ (1885). *Habitat.* Malay Peninsula; Sumatra; Borneo; Palawan.—*Zetides Arycles* (Pap. Arycles, Boisd. Spéc. Gén. Lep. i. p. 23 (1836). Distant, Rhop. Malay. p. 362, pl. 32, fig. 5, (1885). Rothschild, *l.c.* p. 446. *Syn.* Pap. Rama, Felder, Reise Nov. Lep. i. p. 71, pl. 12, fig. D (1865). *Habitat.* Malay Peninsula; Sumatra; Java; Borneo; Palawan.—*Zetides Arycleoides* (Pap. Arycles *subsp.* Arycleoides, Fruhst. Iris, 1901, pp. 344-5; *id.* Berl. Ent. Zeit. 1902, p. 220. *Habitat.* Siam.—*Zetides Sphinx* (Pap. Arycles *subsp.* Sphinx, Fruhst. Iris, 1901, p. 345; *id.* B. E. Z. 1902, p. 220. *Habitat.* Tonkin.—*Zetides incertus* (Pap. Arycles *subsp.* incertus, Fruhst. Iris, 1901, p. 345. *Habitat.* Singapore.

Genus DALCHINA.

Dalchina, Moore, Lep. of Ceylon, i. p. 143 (1881). Kirby, Allen's Nat. Hist. Butt. ii. p. 277 (1896).

Chlorisses,* Swainson, Zool. Illustr. ii. pl. 89 (1832-3).

Papilio (sect. 27, subsect. *a, b, f*), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 304, 306, 349, 351.

Papilio (group 36, part), Rothschild, Nov. Zool. ii. p. 429 (1895).

IMAGO.—Male. *Forewing* elongatedly triangular, attenuated and pointed at the apex; costa slightly arched, exterior margin very long, oblique and nearly even, posterior margin short; cell very long, rather narrow; first and second subcostal branches at nearly equal distances apart, first branch short and anastomosed to the costal, second also touching the costal close to its apex; discocellulars inwardly oblique. *Hindwing* triangular, produced and attenuated hindward; costa short and oblique, exterior margin oblique, sinuous, and produced into a short blunt pointed tail at end of upper median veinlet, abdominal margin long and folded, with a hairy patch beneath; cell very long, narrow; second subcostal branch very concave at the base. *Body* robust, woolly; antennal club very short and thick. Sexes alike.

LARVA.—Smooth; thickened from the second to fifth segment, and thence decreasing to the end; with two short subdorsal fleshy spines on the fourth segment, two shorter spines on the second and third, and two on the anal segment.

PUPA.—Conical; truncated in front; thorax produced into a lengthened obtusely-pointed frontal process.

TYPE.—D. Sarpedon.

DALCHINA SARPEDON (Plate 471, fig. 1, larva and pupa; 1a, b, ♂, 1c, ♀).

Papilio Sarpedon, Linnæus, Syst. Nat. ed. x. p. 461 (1758); *id.* ed. xii. p. 747 (1767); *id.* Mus. Lud. Ulr. p. 196 (1764); Fabricius, Syst. Ent. p. 447 (1795). Esper, Ausl. Schmett. p. 38, pl. 8, fig. 2 (1785). Zinken, Nov. Act. Ac. Nat. Cur. xv. p. 156 (1831). Lucas, Lep. Exot. p. 9, pl. 5, fig. 1 (1835). Thon, Nat. Schmett. p. 19, pl. 6, fig. 22 (1837). De Haan, Verh. Nat. Gesch. Ned. pp. 7, 34, pl. 7, fig. 15 (1840). Doubleday and Hewitson, Gen. D. Lep. i. p. 14 (1846). Hutton, Tr. Ent. Soc. Lond. 1847, p. 51. Kollar, Hügel's Kaschmir, iv. pt. 2, p. 405 (1844). Lucas, Chenu's Encycl. Hist. Nat. Pap. pl. 20, fig. 1 (1853). Moore, Catal. Lep. Mus. E. I. C. i. p. 113, pl. 3, fig. 8, larva (1857). Lang, Ent. Mo. Mag. 1864, p. 101. Felder, Verh. Z. B. Ges. Wien. 1864, pp. 304, 350. Wallace, Tr. Linn. Soc. xxv. p. 65 (1865). Moore, P. Z. S. 1865, pp. 487, 757; *id.* 1878, p. 841; *id.* 1882, p. 257. L'Orza, Lep. Japon. p. 10 (1869). Butler, Catal. Fabr. Lep. B. M. p. 242 (1869). Druce, P. Z. S. 1873, p. 357. Piepers, Tijds. v. Ent. 1876, p. 155; *id.* 1888, p. 346, pl. 7, fig. 8, 9, larva. Butler, P. Z. S. 1877, p. 814; *ib.* Tr. Linn. Soc. Zool. 1877, p. 552. Oberthür, Etud. Ent. iv. p. 59 (1879). de Nicéville, Journ. As. Soc. Bengal, 1881, p. 59. Elwes, P. Z. S. 1881, p. 873; *ib.* Tr. Ent. Soc. 1888, p. 434. Aurivillius, Kong. Sv. Vet. Ak. Handl. 1882, p. 20. Staudinger, Exot.

* Preoccupied as *Chlorissa*, by Stephens, in 1829.

Schmett. i. p. 9 (1884). Butler, Ann. Nat. Hist. 1885, p. 343. Distant, Rhop. Malay. p. 359, pl. 32, fig. 6 (1885). Pryer, Rhop. Nipon, p. 5, pl. 1, fig. 9 (1886). Distant and Pryer, Ann. Nat. Hist. 1887, p. 273. Holland, Tr. Amer. Ent. Soc. 1887, p. 122. Staudinger, Iris, ii. p. 15 (1889). Manders, Tr. Ent. Soc. Lond. 1890, 536. Snellen, Tijd. v. Ent. 1890, p. 305. Watson, Journ. Bombay N. H. Soc. 1891, p. 54. Hagen, Berl. Ent. Zeit. 1892, p. 165; *ib.* Iris, vii. p. 28 (1894). Oberthür, Et. Ent. xvii. p. 4 (1893). de Nicéville, Journ. As. Soc. Beng. 1895, p. 526. Rothschild, Nov. Zool. ii. p. 440 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 213.

Zetides Sarpedon, Hübner, Verz. bek. Schmett. p. 85 (1816); *ib.* Samml. Ex. Schmett. iii. pl. 25 (1827-37).

Chlorisses Sarpedon, Swainson, Zool. Illustr. ii. pl. 89 (1832).

Dalchina Sarpedon, Moore, P. Z. S. 1882, p. 257, *ib.* Journ. Linn. Soc. Zool. 1886, p. 50. Swinhoe, Tr. Ent. Soc. 1893, p. 314. Kirby, Allen's N. H. Butt. ii. p. 277.

Papilio (Dalchina) Sarpedon, Doherty, J. As. Soc. Bengal, 1886, p. 136. Wood-Mason, *ib.* 1886, p. 376. Elwes and de Nicéville, *ib.* 1886, p. 437. de Nicéville, Journ. Bombay N. H. Soc. 1893, p. 54, pl. 1, fig. 11, ♂ (—*melanoid* var.); *id.* Sikkim Gazetteer, 1894, p. 174. Mackinnon, Journ. Bombay N. H. Soc. 1898, p. 595, pl. W, fig. 26a, b, *pupa*.

Papilio Demophon, Meerburgh, Afbeeld, pl. 9 (1775). Shaw, Gen. Zool. vi. i. pl. 64 (1806).

IMAGO.—Male and female. Upperside black. *Forewing* with a medial-discal oblique transverse macular band composed of nine pale emerald-green spots, extending from the apex to the posterior margin, the anterior spots being small and well separated, the posterior broadly widening and conjoined, the two lowest being blue-tinted. *Hindwing* with a medial-discal transverse posteriorly-tapering blue-green band, the broad costal portion of which is whitish; beyond is a submarginal medial row of four slender blue-green lunules, and usually with a more or less obsolescent anterior and posterior grey-scaled lunule; abdominal margin grey, the fold in the male, when open displaying a hairy patch; cilia slenderly alternated with white. Underside dark purplish-brown. *Forewing* with glossy macular band, as above. *Hindwing* with medial band as above, the costal portion being pale green and inwardly bordered by a subbasal black spot traversed by a deep crimson bar; the medial band also outwardly bordered by black patches, the patch at apex of the cell and those from the radial to anal angle traversed by a deep crimson lunule, that at the anal angle being broad; beyond, the submarginal pale green lunules are less defined than on upperside. *Body* greyish-black above; beneath, legs and palpi, grey-streaked; antennæ black.

Expanse, 3 to 3½ inches.

LARVA.—Smooth; thickened from the second to fifth segment, and thence decreasing to the end; with two short subdorsal fleshy spines on the fourth segment, between which is a transverse pale yellow line, two shorter spines also on the second and third, and two on the anal segment; colour green, with a longitudinal posterior lateral and lower pale yellowish line.

PUPA.—Conical; truncated in front; thorax produced into a lengthened obtusely-pointed frontal process.

HABITAT.—N. India; Burma; Tenasserim; Andamans; Malay Peninsula; Tonkin; Hainan; Sumatra; Engano; Java; Natuna Isles; Borneo; Palawan; Philippines; Loo Choo Isles; S. Japan.

DISTRIBUTION AND HABITS.—In the N.W. Himalayas, Capt. T. Hutton says this is “one of the commonest butterflies at Masuri. It appears early in May, and is found till the end of the rains in September. It usually frequents the tops of Oak trees, where it flits about with a jumping or jerking flight, and is somewhat difficult to capture, from its quickness, and the height at which it keeps” (Tr. Ent. Soc. 1847, 51). Capt. A. M. Lang states that it is “seen but in few places in the N.W. Himalayas, and never more than one at a time. It is bold and rapid in flight, and not easily captured” (Ent. Mo. Mag. 1864, 101). Mr. P. W. Mackinnon records it as “very common at Masuri in the spring, summer, and beginning of the rainy season, and in the Dun in March and August. The larva, in Masuri, feeds on the leaves of *Machilus odoratissima*, N.O. Laurineæ. It pupates in June, and the imago emerges the following spring” (Journ. Bombay N. H. Soc. 1898, 595). Mr. W. Doherty obtained it at Sarju, Ramganga, Gori and Kali Valleys, 2,000 to 5,000 feet elevation, in Kumaon” (J. As. Soc. Beng. 1886, 136). Mr. J. H. Hocking took it in the “Kangra Hills. It flies round and round the tops of trees” (P. Z. S. 1882, 257). We have specimens from Nepal, taken by Gen. G. Ramsay. Mr. H. J. Elwes records it as “common in Sikkim at low elevations, and occurs up to 7,000 feet between April and October. It is a very strong flyer, and only caught when settled on wet places in the sun” (Tr. Ent. Soc. 1888, 434). Mr. L. de Nicéville also says it is “common in Sikkim throughout the warm months, from 1,000 to 7,000 feet elevation” (Sikkim Gaz. 1894, 174). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 314). Col. C. H. E. Adamson says it is found “throughout Burma; males being very common, the female very rare” (List, 1897, 49). Lieut. E. Y. Watson took it at “Beeling, Upper Tenasserim; and at Choungkwa, Chin Lushai Hills, in May. It was also common at the foot of the Chin Hills from March to May” (J. Bombay N. H. S. 1888, p. 26; *id* 1891, 54; *id*. 1897, 672). Signor L. Fea took it in the Kharen Hills. Dr. N. Manders found it “abundant in the Shan States; commonest at elevations of 3,000 feet” (Tr. Ent. Soc. 1890, 536). Mr. H. Grose-Smith has examples from the Andamans.

DALCHINA TEREDON (Plate 472, fig. 1, *larva* and *pupa*, 1a, b, c, ♂ ♀).

Papilio Teredon, Felder, Verh. Z. B. Ges. Wien. 1864, p. 305; *id*. Reise Novara Lep. i. p. 61 (1865).

Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 578.

Dalchina Teredon, Moore. Lep. of Ceylon, i. p. 143, pl. 62, fig. 1, 1a, ♂ ♀; 1b, *larva* and *pupa* (1881).

Papilio (Dalchina) Teredon, Hampson, Journ. As. Soc. Bengal, 1888, p. 364. Ferguson, Journ. Bombay N. H. Soc. 1892, p. 446.

Papilio Sarpedon Teredon, Rothschild, Nov. Zool. ii. p. 442 (1895). de Nicéville, Journ. As. Soc. Bengal, 1900, p. 257.

Papilio Sarpedon, var. *a*, Gray, Catal. Lep. Brit. Mus. i. p. 28 (1852).

Papilio Sarpedon, Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 364.

Dalchina Thermodusa, Swinhoe, Proc. Zool. Soc. Lond. 1885, p. 146.

Papilio (Dalchina) Thermodusa, Hampson, Journ. As. Soc. Bengal, 1888, p. 364.

IMAGO.—Male and female. Upperside black, with similar markings to those in *D. Sarpedon*. Forewing with the transverse macular band generally much narrower, the upper spots being smaller and wider separated, and the lower portions mostly divided by black veins; the band is composed of either eight or nine portions, the upper spot being sometimes absent, in both sexes from Ceylon and S. India, the band being either at its narrowest or widest width, this spot—when present—is very small. Hindwing produced into a rather prominent tooth at end of upper median veinlet; the medial band mostly narrower than in *Sarpedon*. Underside with the transverse bands as above. Hindwing with the subbasal crimson bar not inwardly bordered with black; other markings similar to *Sarpedon*.

Expanse, $2\frac{8}{10}$ to $3\frac{5}{10}$ inches.

LARVA AND PUPA.—Similar to that of *Sarpedon* (see Plate 472).

HABITAT.—Ceylon; S. India.

DISTRIBUTION AND HABITS.—In Ceylon this butterfly “is abundant in the Hills, and in the North and Eastern portions of the Island in the low country, but is not found in the damp South-eastern district. The larva feeds on *Cinnamomeum* and many other plants” (Dr. N. Manders, J. As. Soc. Beng. 1899, 224). Mr. F. M. Mackwood records it as “numerous everywhere in Ceylon. In the dry-season dozens together are to be seen on the damp sandy spots near streams. Capt. Wade found it common in Kandy and Galle” (Lep. Ceylon, i. 143). In South India, Mr. S. N. Ward found it “common both above and below the Ghâts on the Malabar Coast, more particularly so on the Nilgiris. The larva was found on the Dalchey-wild Cinnamon” (MS. Notes). Messrs. Davidson and Aitken write, “We found the larva of this at Karwar from July till October on *Litsæa sebisera* and *Alseodaphne semicarpifolia* (N. O. Laurineæ). It is even more shy and retiring than that of *P. Agamemnon*, and we got very few. It is very like that of *Agamemnon*, but prettier, being of a soft, dark green, inclining to emerald and passing into a pale bluish on the last segment and the under parts. The pupa is easily distinguished from that of *Agamemnon* by one mark, viz. the horn is not straight, but curves slightly backwards” (J. Bombay N. H. Soc. 1890, 364). “In the Kanara District the butterfly is commoner than *Agamemnon*, and may be seen all through the dry-season as well as in the rains, but rarely in gardens. Nothing suits it better than a

clearing in heavy forest, with a stream of water to keep the ground cool and moist, for it is a thirsty creature" (*id. l.c.* 1896, 578). Mr. G. F. Hampson obtained it on the "Nilgiris, at 2,000 to 7,000 feet elevation, and two specimens of the form *Thermodusa*, in February, at 3,500 feet" (J. As. Soc. Beng. 1888, 364). Col. C. Swinhoe took his specimens of *Thermodusa* on "Matheran Hill, Bombay, in November and December" (P. Z. S. 1885, 146). We possess specimens from Matheran taken by Dr. A. Leith. Mr. H. S. Ferguson records it as "common in the low country of Travancore, and up to 4,000 feet in the Hills on the South; common also on the high range" (J. Bombay N. H. Soc. 1891, 446).

Of our illustrations on Plate 472, fig. 1, *larva* and *pupa*, is copied from Sir W. Gregory's Ceylon drawings; figs. 1a and c from a Ceylon male and female, and fig. 1b from a Nilgiri male.

DALCHINA CLOANTHUS (Plate 473, fig. 1, *larva* and *pupa*; 1a, b, ♂, 1c, ♀).

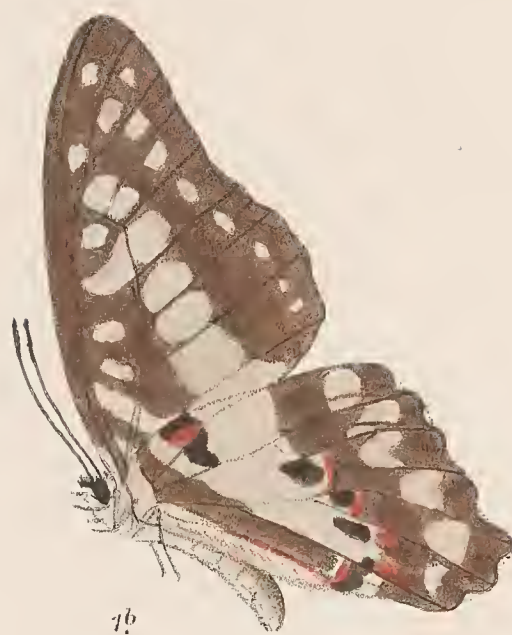
Papilio Cloanthus, Westwood, Arcana Entom. i. p. 42, pl. 11, fig. 2 (1841). Kollar, Hügel's Kaschmir, iv. pt. 2, p. 405, pl. 2, fig. 1, 2 (1844). Hutton, Trans. Ent. Soc. Lond. 1847, p. 51. Gray, Catal. Lep. B. M. i. p. 28 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 112 (1857); *id.* P. Z. S. 1865, p. 757; *id.* 1882, p. 257. Felder, Verh. Z. B. Ges. Wien. 1864, pp. 304, 349. Lang. Ent. Mo. Mag. 1864, p. 101. Oberthür, Etud. Ent. iv. p. 60 (1879). Staudinger, Exot. Schmett. i. p. 9, pl. 6 (1884). Butler, P. Z. S. 1886, p. 376; *id.* Ann. Nat. Hist. 1888, p. 206. Elwes, Tr. Ent. Soc. 1888, p. 439. Rothschild, Nov. Zool. ii. p. 445 (1895). Robson, Journ. Bombay N. H. Soc. 1895, p. 497, *larva*.

Dalchina Cloanthus, Moore, Proc. Zool. Soc. 1882, p. 257. Swinhoe, Tr. Ent. Soc. 1893, p. 314.

Papilio (Dalchina) Cloanthus, Doherty, Journ. As. Soc. Bengal, 1886, p. 136. de Nicéville, Sikkim Gazetteer, 1894, p. 174. Mackinnon, Journ. Bombay N. H. Soc. 1898, p. 595, pl. W, fig. 27, a, b, c, d, *larva* and *pupa*.

Papilio Cloanthus, var. *Cloanthulus*, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 140.

IMAGO.—Male and female. Upperside purplish-black. *Forewing* with a pale olive-green very broad medial transverse band, the upper portion macular to the third median veinlet and composed of five large spots, the lower portion being conjoined and blue-tinted; within the cell is a large rounded spot joined to the outer one in the interspace of the fourth and third median, and also a large elongated triangular lower spot joined to the outer portions in the interspaces of the second and third median. *Hindwing* with a pale olive-green very broad posteriorly-decreasing medial band, and a submarginal row of four large spots, the lower three being conical and the upper one narrow; at the apical and posterior angle is also a slightly-apparent slender greyish lunule, and at the anal angle a very obscure reddish spot. Underside dark purplish-brown. *Forewing* with pale green markings as above, and the outer border traversed by a submarginal pale obscure greyish line. *Hindwing* with a broad pale green band and submarginal spots, as above, the inner

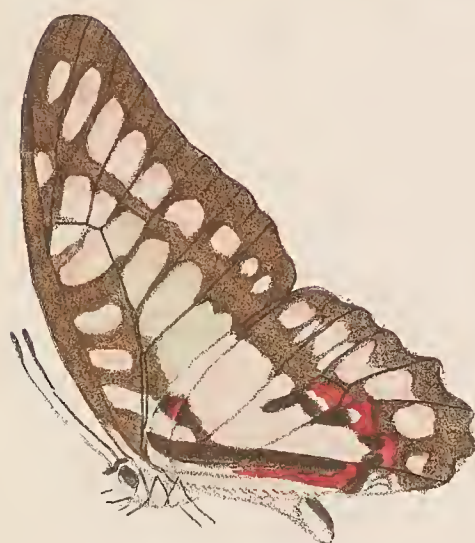




1a



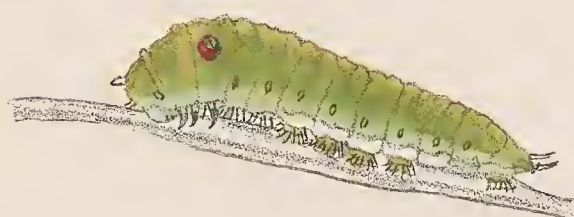
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1b



1d



1e



1.



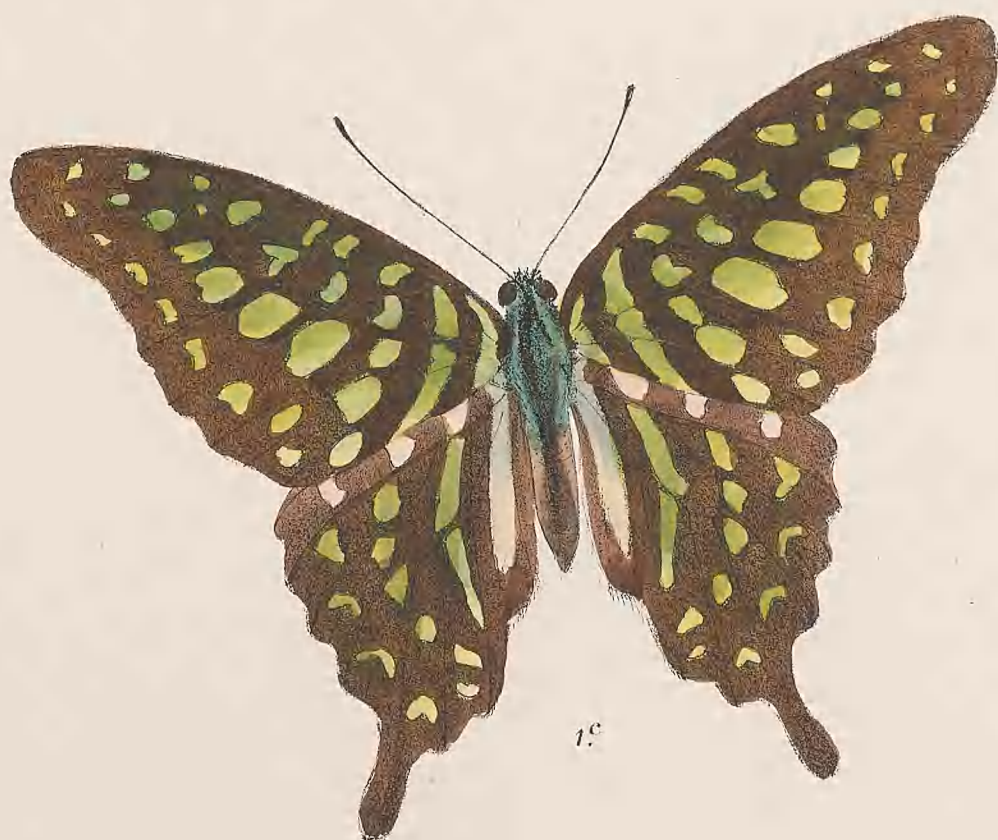
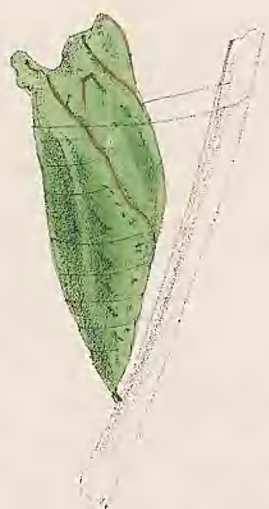
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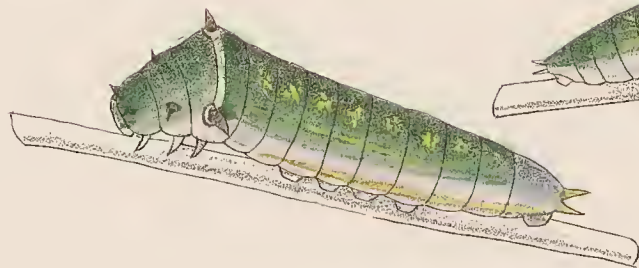
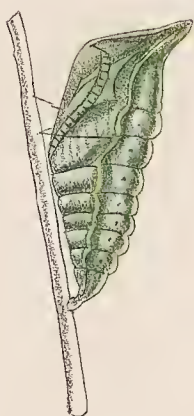
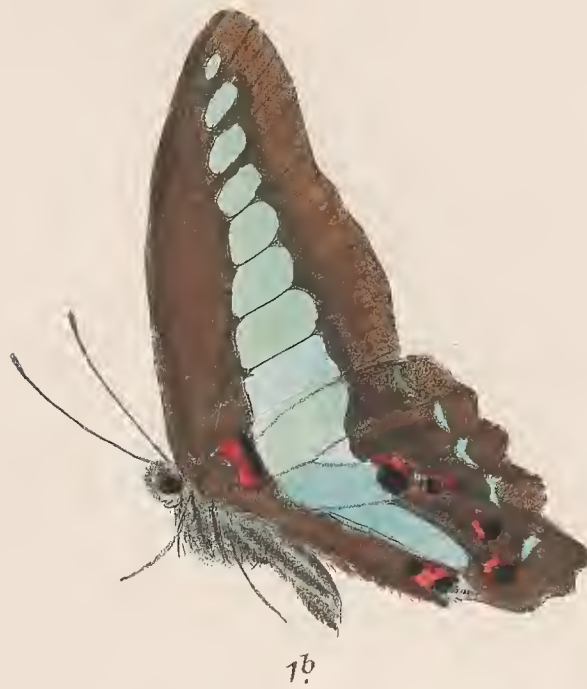


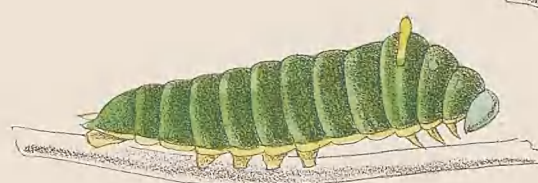
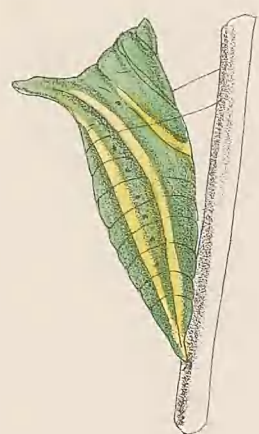
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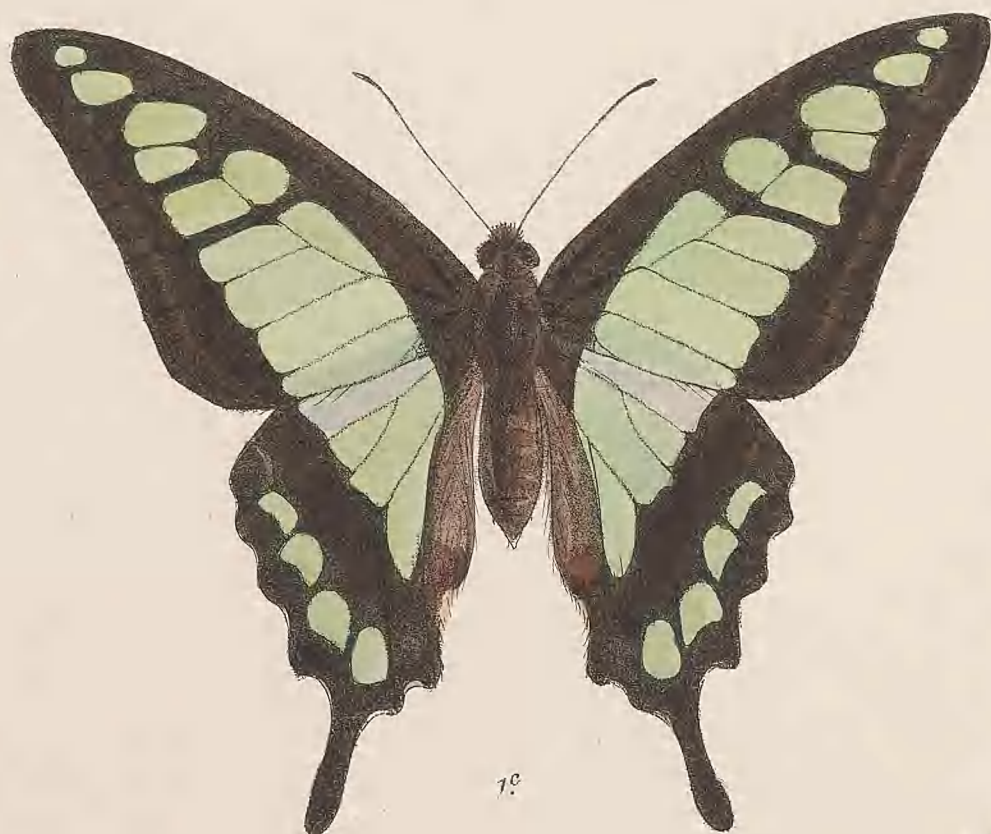
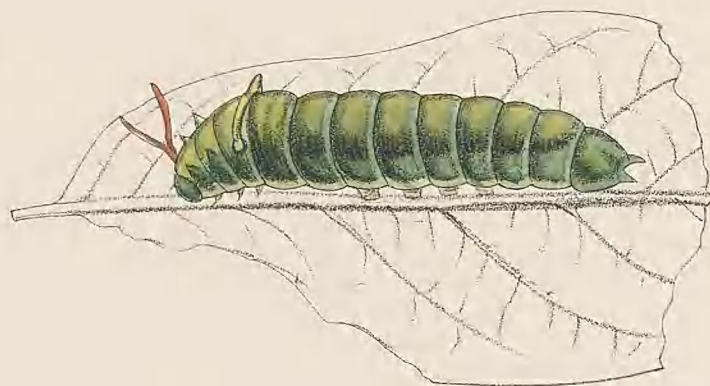


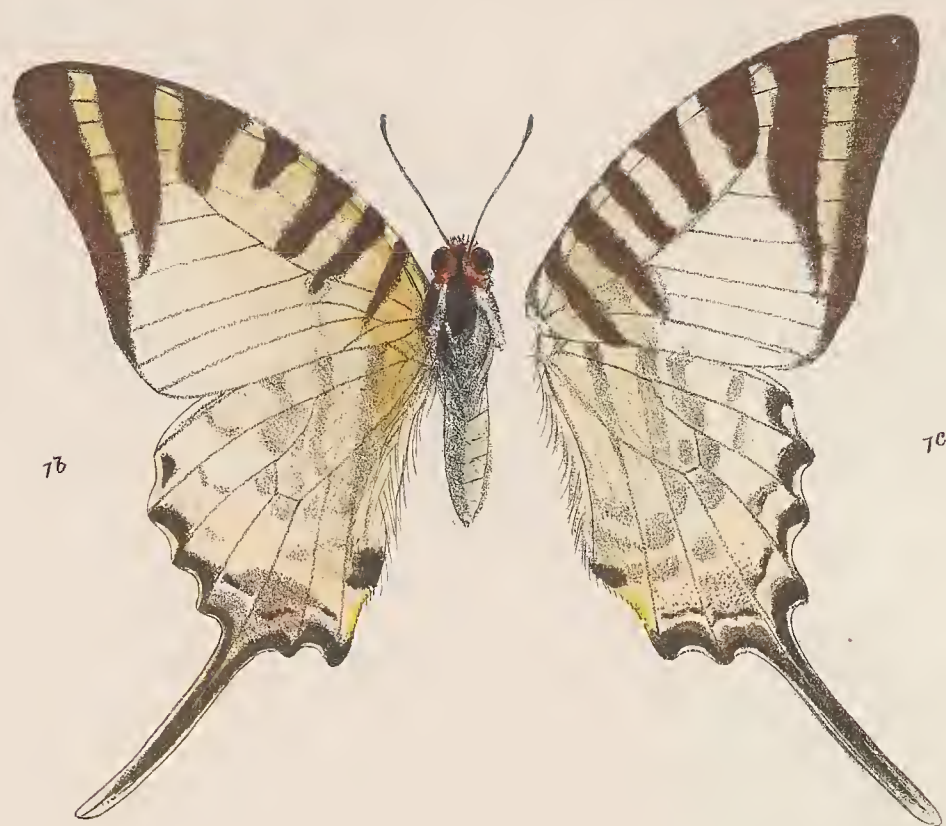
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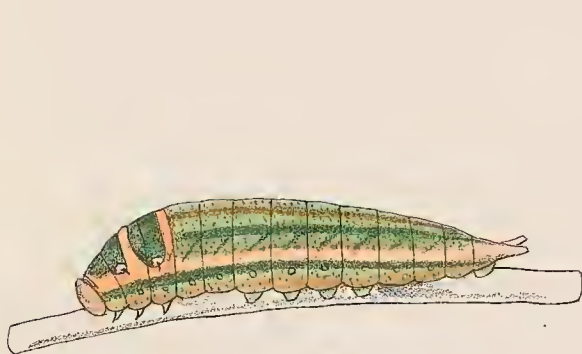
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1b

1c



1a



1



1d



1e

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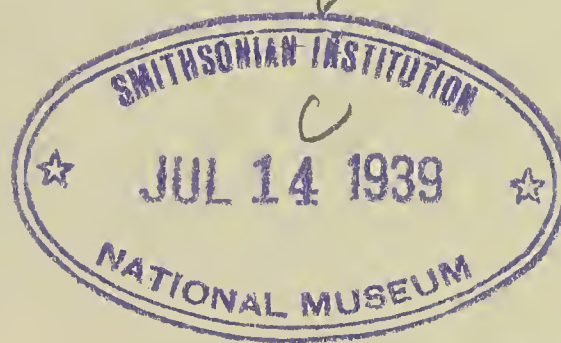
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costal-end of the band with a black patch crossed by a crimson slender sinuous streak, and its lower outer-end from within apex of the cell to anal angle bordered with black patches crossed by crimson lunules; abdominal margin with a grey streak, and in the male with a pale ochreous woolly-patch; cilia from upper median to anal angle slenderly alternated with white. *Body* above greyish-black, beneath and legs greyish; antennæ black.

Expanse, $3\frac{1}{4}$ to 4 inches.

LARVA.—“Full-fed $1\frac{1}{2}$ inch long. Head and neck contractile; body widest at the fifth segment, from which it tapers gradually to the anal segment; the ridge over the head is furnished with two tubercles, black in front, white posteriorly; the fifth segment has a yellow bar which projects on each side beyond the body, and has the appearance of a yoke, the points of this yoke are black. Colour green; the thirteenth segment is of a pale transparent blue-green; a pale yellow subdorsal line, and an almost white spiracular line are the only markings; head greenish-yellow; legs, claspers, and abdomen blue-green; the thirteenth segment terminates in two sharp points which join at the end, so that the division between them is apparent only on close examination” (Mrs. S. Robson, Journ. Bombay N. H. Soc. 1895, 497).

PUPA.—Conical; truncated in front; head slightly cleft in front; thorax angled in front and at the sides, and with a short dorsal frontal projected process. Colour pale green, with a lateral and a divaricated pale yellow dorsal line.

HABITAT.—North Western, Central, and Eastern Himalayas; Assam; Burma; Shan States; ? Malay Peninsula.

DISTRIBUTION, HABITS, ETC.—We have a male from Kashmir, taken by the late Capt. R. Bayne Reed. Capt. T. Hutton records it as “very common, at Masuri, in fine warm weather, flitting with great rapidity over the tops of the loftiest trees. It usually selects some lofty Oak, over the summit of which it continues to dance with a jerking flight, like that of *P. Sarpedon*, until its domain is invaded by another individual, when a rapid chase round and round the tree takes place, one-while they dart away from the tree down the side of the steep mountain, but ever and anon return to the favourite tree, until one is fairly driven off, when the other resumes its dance as before. It is difficult to capture, from its high and rapid flight. It appears at the end of April, and continues throughout the summer” (Tr. Ent. Soc. 1847, 51). Capt. A. M. Lang says it is “equally rare with *P. Sarpedon*, affecting the same localities in the N.W. Himalaya, at altitudes from 5,000 to 7,000 feet. I have taken both the species, sitting with closed wings by the moist margins of a trickling rill” (Ent. Mo. Mag. 1864, 101). Major J. W. Yerbury obtained it at “Murree in August and September” (P. Z. S. 1886, 376). Mrs. S. Robson found the larva at Masuri, in June, on a large and common tree, *Machilus odoratissima*”

(J. Bombay N. H. S. 1895, 497). Mr. P. W. Mackinnon records it as "common in Masuri, in the spring and summer months. The larva feeds on the leaves of *Machilus odoratissima*, N. O. Laurineæ. It is bright green with a yellow collar on the fifth segment. The pupa is bright green, with the angles yellow. The larva pupates in June, and the butterfly emerges in the following April" (J. Bombay N. H. S. 1898, 595). Mr. W. Doherty took it at "Khati, Loharkhet, and in Lower Ranganga, 2,000 to 7,000 feet, in Kumaon. Gen. G. Ramsay obtained it in Nepal. Specimens labelled Nepal, and Barrackpur near Calcutta, are in the British Museum. Mr. H. J. Elwes writes, "Möller gives the habitat of this species, in Sikkim, as from 2,000 to 4,000 feet; occurring from April to October. I saw it in Khasia at 6,000 feet, flying on sunny days round the tops of trees with very rapid flight, and hard to catch" (Tr. Ent. Soc. 1888, 434). Mr. G. C. Dudgeon took it in Bhotan. Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 314). Mr. W. Rothschild records it from the Shan States (Nov. Zool. ii. 1893, 445).

Of our illustrations on Plate 473, fig. 1, larva and pupa, is copied from Mr. Mackinnon's Masuri drawings; fig. 1a, b, male from Kashmir, and fig. 1c, female from N.W. Himalaya.

INDO-MALAYAN SPECIES.—*Dalchina rufofervida* (Pap. *Sarpedon rufofervidus*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 305). *Habitat.* Nias.—*Dalchina semifasciata* (Pap. *Sarpedon*, *var.* *semifasciatus*, Honrath, Ent. Nachr. 1881, p. 161. Rothschild, Nov. Zool. ii. p. 442. Pap. *Sarpedon*, *var.* *Leech*, Tr. Ent. Soc. 1889, p. 115, pl. 7, fig. 2. Fruhst. Berl. Ent. Zeit. 1902, p. 215. *Habitat.* China.—*Dalchina Parsedon* (Pap. *Parsedon*, Westwood, Tr. Ent. Soc. 1872, p. 99, pl. 5, fig. 1, 2). *Habitat.* Java (Coll. Moore).—*Dalchina Clymena* (Pap. *Cloanthus*, *var.* *Clymenus*, Leech, Butt. of China, p. 523, pl. 32, fig. 2 (1893). Rothschild, *l.c.* p. 445). *Habitat.* C. and W. China.—*Dalchina Sumatrana* (Pap. *Cloanthus* *var.* *Sumatranus*, Hagen, Iris, vii. p. 27 (1894). Rothschild, *l.c.* p. 445). Pap. (Dal.) *Cloanthus*, de Nicéville, J. As. Soc. Beng. 1895, p. 526. *Habitat.* Sumatra.

Genus *Idaides*, Hübner, Verz. bek. Schmett. p. 85 (1816). *Papilio* (Group 35) Rothschild, Nov. Zool. ii. p. 424. *Type.* I. *Codrus*.—*Idaides Empedocles* (Pap. *Empedocles*, Fabricius, Mant. Ins. ii. p. 10 (1787). Donovan, Ins. of India, pl. 20, fig. 1 (1800). Wallace, Tr. Linn. Soc. 1865, p. 65. Butler, Catal. D. Lep. Fabr. B. M. p. 243 (1869). Rothschild, Nov. Zool. ii. p. 427 (1895). de Nicéville, Journ. As. Soc. Beng. 1895, p. 525. *Habitat.* Sumatra Java; Banka; Borneo.—*Idaides Melanthus* (Pap. *Melanthus*, Felder, Wien. Ent. Monats. vi. p. 283; *id.* Nov. Voy. Lep. i. p. 72, pl. 12, fig. C, ♂ (1865). Semper, Phil. Tagfalt. p. 279 (1892). Pap. *Codrus Melanthus*, Rothschild, Nov. Zool. ii. p. 426. *Habitat.* Philippines.

Genus PATHYSA.

- Pathysa*, Reakirt, Proc. Ent. Soc. Philadelphia, iii. pp. 503, 504 (1864). Moore, Lep. of Ceylon, i. p. 141 (1881). Kirby, Allen's Nat. Hist. Butt. ii. p. 274 (1896).
Iphiclides (part), Hübner, Verz. bek. Schmett. p. 82 (1816).
Podalirius (part), Swainson, Zool. Illustr. ii. pl. 105 (1833).
Papilio (part), Doubleday and Hewitson.
Papilio (sect. 21, subsect. C), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 302, 346.
Papilio (group 31), Rothschild, Nov. Zool. ii. p. 410 (1895).

IMAGO.—Male. *Forewing* broad, triangular; costa very much arched; apex obtuse; exterior margin oblique, concave in the middle and slightly uneven posteriorly; cell long, broadest across the middle; first subcostal branch short and anastomosed to the costal, emitted at about one-seventh, and second branch at one-tenth before end of the cell; discocellulars nearly straight, upper slightly longest. *Hindwing* broad; costa rather long and oblique; exterior margin convex, very sinuous and produced into a very long narrow ensiform tail; cell very long and narrow; first subcostal at one-half before end of the cell, second branch concave at the base; discocellulars bent outward, radial from their angle; abdominal margin with an elongated hairy scent-organ beneath the fold. *Body* short, stout; antennæ with a short thick rounded club. Sexes similar.

LARVA.—Smooth; slightly distended about the fourth and fifth segments; with two short pointed subdorsal tubercles on third and fourth segment, two fleshy tubercles on second, and two on anal segment.

PUPA.—Attenuated at anal end; thorax truncated in front and with a short frontal dorsal prominence; head excavated in front.

TYPE.—P. Antiphates.

PATHYSA ALCIBIADES (Plate 474, fig. 1, 1a, larva and pupa, 1b, c, d, ♂, 1e, ♀).

- Papilio Alcibiades*, Fabricius, Mant. Ins. ii. p. 8 (1787); Ent. Syst. iii. i. p. 25 (1793).
Papilio Antiphates, var. *Alcibiades*, Butler, Catal. Fabr. Lep. B. M. p. 240 (1869).
Papilio Antiphates Alcibiades, Rothschild, Nov. Zool. ii. p. 411 (1895).
Papilio Antiphates, Boisduval, Spec. Gén. Léop. i. p. 248 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 15 (1846). Gray, Catal. Lep. B. M. i. p. 31 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 116, pl. 3, fig. 10, 10a, larva and pupa (1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 302, 346. Wallace, Trans. Linn. Soc. Lond. 1865, p. 63. Moore, P. Z. S. 1865, p. 757; *id.* 1878, p. 841. Butler, Trans. Linn. Soc. Zool. 1877, p. 552; *id.* Ann. Nat. Hist. 1885, p. 342. Piepers, Tijd. v. Ent. 1888, p. 349, pl. 8, fig. 4, larva. Elwes, Tr. Ent. Soc. Lond. 1888, p. 433. Eimer, Artbild. Schmett. pl. 2, fig. 2 (1888). Robbe, Ann. Soc. Ent. Belg. 1892, p. 126. Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 579, pl. 6, fig. 1, 1a, larva and pupa.
Pathysa Antiphates, Moore, Lep. of Ceylon, i. p. 142, pl. 63, fig. 1, 1a, ♂ (1881); *id.* Journ. Linn.

- Soc. Zool. 1886, p. 50. Swinhoe, Tr. Ent. Soc. 1893, p. 313. Kirby, Allen's Nat. Hist. Butt. ii. p. 274 (1896).
- Papilio (Pathysa) Antiphates*, Wood-Mason, Journ. As. Soc. Beng. 1886, p. 376. Elwes, *ib.* 1886, p. 437. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 445. de Nicéville, Sikkim Gaz. 1894, p. 174; *id.* Journ. As. Soc. Beng. 1895, p. 524.
- Papilio Pompilius*, Fabricius, Mant. Ins. ii. p. 8 (1787); *id.* Ent. Syst. iii. i. p. 25 (1793). Horsfield, Catal. Lep. Mus. E. I. Company, pl. 3, fig. 3, 3a, *larva* and *pupa* (1828). Lucas, Lep. Exot. p. 43, pl. 22, fig. 1 (1835).
- Iphiclides Pompilius*, Hübner, Verz. bek. Schmett. p. 82 (1816).
- Podalirius Pompilius*, Swainson, Zool. Illust. ii. pl. 105 (1833).
- Papilio Antiphates*, var. *Pompilius*, Distant, Rhop. Malay. p. 357, pl. 31, fig. 5, ♂ (1885). Hagen, Berl. Ent. Zeit. 1892, p. 155, *id.* Iris, 1894, p. 27. Fruhstorfer, Berl. Ent. Zeit. 1902, p. 197.
- Papilio nebulosus*, Butler, Ann. and Mag. Nat. Hist. 1881, p. 33, pl. 4, fig. 3 (*melanoid* var.).
- Papilio Itamputi*, Butler, in Forbes' Nat. Wand. Sumatra, p. 276 (1885).
- Papilio Antiphates Javanicus*, Eimer, Artbild. Schmett. p. 136 (1888).
- Papilio Antiphates continentalis* et *Ceylonicus*, Eimer, *l.c.* pp. 137, 149 (1889).

IMAGO.—Male. Upperside pale olivescient yellowish-white. *Forewing* with eight transverse black bands, each proceeding from the costa; the first slender and at the extreme base, the second also somewhat slender and ending either at the submedian vein or extending to the posterior margin; the third generally ending in the lower median interspace but sometimes at the submedian vein; the fourth, fifth and sixth broader and not extending beyond lower border of the cell; the fifth being sometimes short and wedge-shaped—and then not crossing the cell; the seventh broad, tapering posteriorly, and ending at the second or first median veinlet, its lower end sometimes partly coalesced to the marginal band, the latter ending before or at the posterior angle; basal and apical interspaces tinted with pale olive-green, and the veins in the latter black lined. *Hindwing* with a marginal zigzag row of black lunules, these being mostly continuous and include the length of the tail, also a broader spot at anal angle; a submarginal series of more or less defined slender black-speckled lunules, the latter being sometimes obsolete anteriorly; the caudal area with a more or less broad dusky-grey patch sparsely speckled with black scales; the basal and discal markings of the underside also visible, as greyish patches, by semitransparency; cilia alternated with white, including edge of the tail. Underside. *Forewing* white, with transverse bands as on the upperside, the basal being black, the anterior purplish-black, and their interspaces darker olivescient-green tinted. *Hindwing* with a black variable narrow transverse basal, subbasal, and inner-discal band, the two latter obliquely crossing the cell and the three ending in a short cross bar in the submedian and lower median interspace, the two inner bands are straight, the outer somewhat sinuous; beyond is a discal transverse parallel row of various-shaped black spots, the upper one being narrow and curved, the next large and conical, the next four small and rounded—one of the latter being within apex

of the cell; these are followed by a black bar between that of the basal bands and the large anal spot; beyond is a submarginal row of black slender broken lunules, which are more defined than on upperside, and then the marginal zigzag row of lunules; basal interspaces tinted with dark olivescient-yellow, and the outer discal interspaces clouded with bright yellowish-ochreous. *Body* and legs greyish-white; sides of abdomen pale ochreous, with a longitudinal row of black spots; thorax above clothed laterally with fine grey hairs, a longitudinal black dorsal streak extending to front of head; collar and sides of frontal tuft ochreous; forelegs blackish above; tarsi blackish; antennæ black.

Female. Upperside similar to the male. *Hindwing* with the dark grey caudal patch broader. Underside similar to the male.

Expanse, ♂ 3 to $3\frac{3}{4}$, ♀ $3\frac{3}{4}$ to 4 inches.

LARVA.—Smooth; slightly distended about the fourth and fifth segment; with two short pointed subdorsal tubercles on third and fourth segment, two fleshy tubercles on second segment, and two on anal segment. The colour, according to specimens reared by Davidson and Aitken (*l.c.* 1890, 579), “in its early stages, is pure white, marked only with thin transverse lines of black or dark green; at the last moult but one it becomes yellow, with thicker lines, and after the last moult attains the colour shown in our figure. Feeds on *Unona Lawii*, N. O. Anonaceæ.”

PUPA.—Attenuated at anal end; thorax truncate in front and with a short frontal-pointed dorsal prominence; colour pale green, with lateral pale yellowish line.

HABITAT.—Ceylon; S. and C. India; Assam; Sikkim; Bhotan; Burma; Shan States; Siam; Tenasserim; Malay Peninsula; Sumatra; Java; Borneo.

DISTRIBUTION AND HABITS.—In Ceylon, according to the observations of Mr. F. M. Mackwood, this is “a scarce butterfly, being found only in a few localities, widely apart, at about 1,500 to 3,000 feet range. Capt. Hutchison obtained it in the Eastern Province, in plains and forest, in August. Capt. Wade took it in the Kottowar forest, and at Galle; rare elsewhere” (*Lep. Ceylon*, i. 142). Dr. N. Manders says it is “rare and local in Ceylon. It seems to be more partial to the Eastern and drier parts of the Island” (*J. As. Soc. Beng.* 1899, 223).

In S. India, Messrs. Davidson and Aitken write, “Our acquaintance with this species is limited. We first met with it at Gairsoppa, in the South of Kanara, but have since found it at one or two places further North. It begins to appear in March, and there can be little doubt that it is on the wing for a few months only, like *P. Nomius*. On April 26th, 1893, a female deposited a single egg, and though the little caterpillar which emerged perished by starvation, the plant (*Unona Lawii*) not being then obtainable, we next year succeeded in getting a few more, and an amateur figure was made of the larva and pupa. The pupa is supported by an

uncommonly long band, and from its green colour would seem to be normally formed on the plant and not under stones" (J. Bombay N. H. S. 1896, 579). We possess a coloured drawing of a specimen taken by the late Sir Walter Elliot at Nullacherla, between Rajamundry and Ellore, Madras. Mr. H. S. Ferguson records it as "rare in Travancore; two specimens only being taken, in open forest, at the foot of the Ashambu Hills in August, and some were taken by Mr. Garrett near Ariankarvu" (J. Bombay, N. H. S. 1891, 313). Mr. W. C. Taylor says it is "not common at Khorda, in Orissa" (List, p. 16). Col. C. Swinhoe has received it "in great numbers, from the Khasia Hills" (Tr. Ent. Soc. 1893, 313). Dr. G. Watt obtained it near Manipur (Ann. N. H. 1885, 342). Mr. J. Wood-Mason obtained "nine males and one female at Silcuri, Cachar, from March 19th to July 29th (J. As. Soc. Beng. 1886, 376). Mr. H. J. Elwes records it as "common in the lower valleys of Sikkim, up to 3,000 feet, from April to October" (Tr. Ent. Soc. 1888, 433). Capt. E. Y. Watson found it "not uncommon at the foot of the N. Chin Hills, Burma, from March to May" (J. Bombay N. H. S. 1897, 672). Col. C. H. E. Adamson obtained it at "Moulmein; taken in company with *P. Nomius*, but it is much less common" (List, 1897, 48). Capt. Watson also says it is "common at Beeling, N. of Moulmein" (J. Bomb. N. H. S. 1888, 26). Mr. H. J. Elwes records "many males from Ponekai and the Hills on the Siamese frontier" (J. As. Soc. Beng. 1886, 437). Dr. J. Anderson took it in "Mergui, Tenasserim, in December and March" (J. Linn. Soc. Zool. 1886, 50).

Dr. N. Manders writes that "it is common, in N.E. Sumatra, over the whole of our area, in and near forest, throughout the year, but most abundant in March. The males come in crowds to wet spots on roads, and settle among a number of *Pierinæ*, where they evidently feel protected, as they also have white wings. When on the wing they look like a "White," as their long tails, when flying rapidly, can hardly be seen. The females are only caught in the forest, as they do not come to roads" (J. As. Soc. Beng. 1895, 524).

Of our illustrations on Plate 474, fig. 1, *larva* and *pupa*, is copied from Messrs. Davidson and Aitken's S. Indian drawing, and fig. 1a from Dr. Piepers' Java larva; fig. 1b, d from a Sikkim male, 1c from a Ceylon male, and 1e from a Sikkim female.

PATHYSA NAIRA (Plate 475, fig. 1, 1a, ♂).

IMAGO.—Male. Smaller than *P. Epaminondas*. Upperside. *Forewing* with similar-positioned black bands, the two subbasal being much narrower, and the second one not quite reaching the submedian veinlet; the other bands also comparatively narrower, the submarginal and marginal being coalescent from the third median, their anterior pale olivaceous interspace composed of less quadrate-shaped

portions. *Hindwing* with much less apparent transverse subbasal and discal markings; the outer marginal dark grey band is not so broad as in *Epaminondas*, and the marginal black lunules are narrower. Underside. *Forewing* with black transverse markings as on upperside, the two outer bands being divided throughout their length. *Hindwing* with prominent black markings disposed as in *Epaminondas*; the subbasal and discal band being narrower, the bordering outer spots of the latter longitudinally larger, the upper one being inwardly angled, the submarginal and marginal lunules narrower.

Expanse, ♂ 3 to $3\frac{1}{4}$ inches.

HABITAT.—Travancore, S. India. Described from two males, in our collection, labelled Travancore.

PATHYSA EPAMINONDAS (Plate 475, fig. 2, 2a, ♂, 2b, ♀).

Papilio Epaminondas, Oberthür, Etudes Ent. iv. p. 62, pl. 4, fig. 1, ♂ (1879). Staudinger, Exot. Schmett. i. p. 9, pl. 6, ♂ (1888). Eimer, Artbild. Schmett. p. 121, pl. 2, fig. 6 (1889). Rothschild, Nov. Zool. ii. p. 414 (1895).

Papilio Laestrygonum, Wood-Mason, Proc. As. Soc. Bengal, 1880, p. 102; *id.* Journ. As. Soc. Bengal, 1880, p. 178, pl. 6, fig. 1, ♂. de Nicéville, *l.c.* 1880, p. 238; *id. l.c.* 1881, p. 253, ♀. Marshall and de Nicéville, Butt. of India, etc., i. front plate, fig. 1, 1a, ♂ (1882).

Papilio Antiphates, Moore, Proc. Zool. Soc. 1865, p. 593.

IMAGO.—Male and female. Upperside creamy-white. *Forewing* with a black slender streak at its junction with the thorax; two black outwardly-oblique transverse subbasal bands extending from the costa to posterior margin, the second emitting a slight outward point at base of the lower median veinlet; a broader short band across middle of the cell, a short wedge-shaped band and then a much broader band, the latter extending across and beyond end of the cell; beyond is a transverse submarginal broad band, which widens below end of the cell and then decreases to the posterior margin, followed by a broad marginal band, the two latter being obscurely coalescent posteriorly from the second median; interspaces between the basal and subbasal bands and also that between the cell and submarginal and of the latter and marginal band, slightly tinted with pale olivescent-yellow. *Hindwing* with a black slender streak at the extreme base; a subbasal transverse more or less pale greyish-black band extending from the anterior margin across the cell and thence paler scaled for half distance along each side of the lower median; beyond is a discal parallel paler grey waved band, which is outwardly bordered by a series of partly coalescent similar-coloured blackish-centred lunular patches, these two latter being the bands of the underside showing through the wing; followed by a broad marginal dark grey band, sparsely speckled with black scales, and traversed by a submarginal and an outer marginal series of black lunules,

the two upper pairs being partly coalesced; a broad black lunule also at the anal angle, the anal area below the latter being tinted with pale ochreous; cilia between the veins, and the tail edges white. Underside pale bluish-white. *Forewing* with purplish-black similar transverse bands, as above, except that the two subbasal do not reach the posterior margin, and the marginal band is separated from the submarginal throughout its length; the basal and apical interspaces tinted with pale olivescient-yellow. *Hindwing* with a well-defined black transverse slender basal band, which is continued along the submedian vein, a subbasal band, a discal band and a contiguous outer macular band, the latter series curving inward to the end of the basal band between it and the anal spot, and its costal portion is lengthened and is either erect or slightly angled inward; the submarginal and marginal black lunules narrower than on the upperside, and their interspaces pale grey, the former being inwardly broadly-bordered with diffused ochreous-yellow; basal interspaces also tinted with pale olivescient-yellow. *Body* greyish-white; head black with two frontal white bands; collar with two ochreous spots; thorax above black, bordered on each side with long grey hairs, beneath white; abdomen greyish-white, with a blackish longitudinal dorsal band and a lateral broken segmental band; legs black above, white beneath; antennæ black.

Expanse, $3\frac{1}{2}$ to $3\frac{3}{4}$ inches.

HABITAT.—Andaman Islands.

DISTRIBUTION.—Specimens were taken at Port Blair, S. Andamans, by Mr. F. de Roëpstorff.

PATHYSA ANTICRATES (Plate 476, fig. 1, 1a, b, ♂, 1c, ♀).

Papilio Anticrates, Doubleday, Ann. and Mag. Nat. Hist. xviii. p. 371 (1846); Doubleday and Hewitson, Gen. D. Lep. i. p. 14 (1846). Gray, Catal. Lep. Brit. Mus. i. p. 29, pl. 3, fig. 3, 3a, (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 115 (1857); *id.* P. Z. S. 1865, p. 759. Felder, Verh. Z. B. Ges. Wien. 1864, p. 302; Distant, Rhop. Malayana, p. 470, pl. 42, fig. 7 ♂ (1886). Elwes, Trans. Ent. Soc. Lond. 1888, p. 434. Eimer, Artbild. Schmett. p. 170, pl. 3, fig. 6 (1889). Hagen, Iris, 1894, p. 27.

Pathysa Anticrates, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 313.

Papilio (Pathysa) Anticrates, de Nicéville, Sikkim Gazetteer, 1894, p. 174.

Papilio Aristeus Anticrates, Rothschild, Nov. Zool. ii. p. 419. Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 136.

Papilio Pathysa Hermocrates, Elwes, Journ. As. Soc. Bengal, 1886, p. 437. de Nicéville, *id.* 1895, p. 525.

Papilio Aristeoidea, Eimer, Artbild. Schmett. p. 163, pl. 3, fig. 3 (1889).

Papilio Anticrates var. *nigricans*, Eimer, *l.c.* p. 175, fig. T (1889)—*melanic* var.

IMAGO.—Male. Upperside white, with a very faint bluish tint. *Forewing* with six black transverse bands and a broad outer marginal band, from the costa; the

first slender and at the extreme base, the second broader and extending to posterior margin, the other four still broader, the third terminating decreasingly either at the submedian vein or posterior margin, the fourth, fifth, and sixth only crossing the cell, the fifth being, more generally, wedge-shaped and not reaching lower edge of the cell; beyond is the much broader black marginal band decreasing posteriorly and traversed medially by a linear row of narrow white lunules. *Hindwing* with a black slender extreme abdominal marginal fold, outwardly fringed with grey hairs, the fold beneath lined with long pale ochreous hairs; a black transverse subbasal band extending from the costa obliquely across base of the cell and thence more or less decreasingly and less defined along lower median to above anal angle, followed beyond by a parallel inner-discal more or less defined band, which is interrupted across the cell, the anterior portion formed by a decreasing or constricted grey-edged streak, the lower portion, from below apex of the cell to above anal angle, being macular and grey-edged, and in some specimens the crimson streaks of the underside are slightly apparent; beyond is a black marginal band with incurved sinuous inner-edge, traversed by a row of six slender white incurved lunules, the caudal inner-interspaces of the band being speckled with grey scales; cilia and edges of the tail slenderly alternated with white. Underside. *Forewing* pale bluish-white; with transverse bands, as above, but of an ochreous-brown colour, the third and marginal darkest. *Hindwing* with a broad subbasal transverse brown band, a parallel inner-discal broken duplex-band from the costa to anal angle, the inner and outer portions, between the veins, being black (the inner sometimes dark brown anteriorly), and each pair with a central deep crimson streak; the marginal band, as above, pale brown, and traversed by six black outer lunules centred by a slender white lunule; cilia as above. *Body* black above; thorax, front of head and abdomen with a lateral greyish-white band; abdomen beneath and legs greyish-white, femora above black; antennæ black.

Female. Upperside similar to the male. *Hindwing* with the discal crimson streaks of the underside more apparent. Underside similar to the male.

Expanse, ♂ $2\frac{1}{2}$ to 3, ♀ 3 inches.

LARVA.—Unknown.

HABITAT.—Sikkim; Bhotan; Assam; Khasias; Burma; Tenasserim; Malay Peninsula; Sumatra; Borneo.

DISTRIBUTION.—Mr. H. J. Elwes records it as "rare in the lowest valleys of Sikkim, but found in abundance by Mr. Otto Möller's native collectors at Sivoke in May" (Tr. Ent. Soc. 1888, 434). Mr. L. de Nicéville says it "occurs in Sivoke in April and May only, when it is very common. It is also found along the Rungeet road in the same months, but elsewhere it seems scarce. It is single brooded" (Sikkim Gazetteer, 1894, 174). Specimens from Shillong, Assam, are

in the British Museum. Mr. G. C. Dudgeon took it in Bhotan; Col. C. Swinhoe has received "a great number of specimens from the Khasia Hills" (Tr. Ent. Soc. 1893, 313). Col. C. H. E. Adamson "took two males in Akyab, in March. It also occurs not uncommonly at Katha in Upper Burma" (List, 1897, 48). Specimens from Tenasserim are in the British Museum.

PATHYSA NOMIUS (Plate 477, fig. 1, 1a, larva and pupa, 1b, c, ♂, 1d, e, ♀).

- Papilio Nomius*, Esper, Ausl. Schmett. p. 210, pl. 52, fig. 3 (1785-93). Boisduval, Spec. Gén. Lép. i. p. 251 (1836). Berge, Schmett. 109, pl. 34, fig. 3 (1842). Doubleday and Hewitson, Gen. D. Lep. i. p. 14 (1846). Moore, Catal. Lep. Mus. E. I. Company, i. p. 115 (1857), *id.* P. Z. S. (1867), p. 578. Oberthür, Etud. Ent. iv. p. 63 (1879). Staudinger, Exot. Schmett. i. p. 9 (1884). Eimer, Artbild. Schmett. p. 164, fig. Q, et pl. 3, fig. 4 (1889). Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1890, p. 364, pl. E, fig. 1, 1a, larva and pupa. Beetham, *id.* 1891, p. 330. Rothschild, Nov. Zool. ii. p. 421 (1895). de Nicéville, Journ. As. Soc. Beng. 1899, p. 223.
- Pathysa Nomius*, Moore, Lep. of Ceylon, i. p. 142, pl. 62, fig. 2 (1881). Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 313.
- Papilio (Pathysa) Nomius*, de Nicéville, Journ. As. Soc. Beng. 1885, p. 51. Hampson, *id.* 1888, p. 364. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 446.
- Princeps Heroicus Meges*, Hübner, Samml. Exot. Schmett. i. pl. 106 (1806-24).
- Iphiclides Meges*, Hübner, Verz. bek. Schmett. p. 82 (1816).
- Papilio Niamus*, Godart, Encyc. Méth. ix. p. 51 (1819). Swainson, Zool. Illustr. ii. pl. 32 (1831-3).
- Papilio Orestes*, Gray, Catal. Lep. B. M. i. p. 29 (1852). Butler, Catal. Fabr. Lep. B. M. p. 240 (1869).
- ? *Papilio Orestes*, Fabricius, Ent. Syst. iii. i. p. 34 (1793).
- Papilio Orestes*, var. Feld. Verh. Z. B. Ges. Wien. 1864, pp. 302-346.

IMAGO.—Male. Upperside bluish-white. *Forewing* with six black transverse bands and a broad outer-marginal band; the first slender and at extreme base, second and third extending to the posterior margin, fourth generally ending below the cell, but not reaching to the lower median, fifth and sixth extending only across the cell; the marginal band broader than in *P. Anticrates*, its inner-edge being excurved between the veins, and submarginally traversed by a row of rounded white spots, of which the apical second is placed obliquely outward. *Hindwing* with a blackish grey slender extreme abdominal marginal fold, fringed with grey hairs; a black transverse subbasal and an inner-discal band, both ending posteriorly in a cross macular bar near and above anal angle; beyond is a broad black marginal band with excurved inner-edge between the veins, and traversed by a row of white lunules, the caudal inner-interspaces of the band and the lower lunules being speckled with grey scales. In some specimens the two inner transverse bands, on both wings, are narrower and more attenuated posteriorly. Cilia and edges of tail slenderly alternated with white. Underside. *Forewing* bluish-white, with trans-

verse bands, as above, of an ochreous-brown colour, the third and marginal being darkest posteriorly, in some the bands are of a uniform dusky-brown. *Hindwing* with the subbasal and marginal band ochreous-brown or dusky-brown; a discal transverse broken duplex-band from the costa to anal angle, its inner and outer portions between the veins being black, and each pair with a central red or crimson streak; the marginal band traversed by six black lunules, each broadly centred by a grey-scaled lunule, the caudal inner-interspaces being pale ochreous or greyish-ochreous; cilia and tail as above. *Body* black above; thorax, front of head, and abdomen with a lateral greyish-white band; abdomen beneath and legs greyish-white; antennæ black.

Female. Upperside similar to the male. Underside. *Forewing* with darker brown bands. *Hindwing* also with darker brown bands; the discal crimson streaks brighter, and the outer marginal grey-centred lunules broader.

Expanse, ♂ $2\frac{3}{4}$ to $3\frac{1}{4}$, ♀ $3\frac{1}{2}$ inches.

LARVA.—Smooth; anterior segments somewhat thickened, and with three pairs of small fleshy sharp spines, a pair also on the anal segment. Colour usually black, banded on the sides with narrow white stripes, except on the first three or four segments and the last, on which there is more or less rusty-red, but the shade varies very much, and in some the ground-colour is green.

PUPA.—Head with two short processes in front, and a short forward-projected dorsal prominence. Colour earthy-brown. Attached by tail and silken girdle, in crevices, or under stones and roots.

HABITAT.—Ceylon; South, Central, and Lower Provinces of India.

LIFE HISTORY, HABITS OF LARVA, ETC.—“This butterfly was very common, in the North Kanara District of Bombay, in 1889, in March, June, and July. It frequented one particular spot about half-way up the Goodhally Hill; elsewhere we seldom met with it. On June 23rd we discovered the larva on a jungle tree (since identified as *Saccopetalum tomentosum*, N. O. Anonaceæ), and literally collected hundreds. By the end of July these had all become pupæ, and we got no more. Of the pupæ a few produced butterflies in the course of the same month, but the great majority remained until February following, when a little rain fell and a few butterflies emerged, but they stuck to the pupa case, or else their wings failed to expand, for want of moisture apparently. We took the hint and watered about twenty, with the result that the butterflies came out of them all in good condition. We had lost a great many by accidents when on tour, and the few had hatched at odd intervals; but we kept what remained carefully until June, and within a few days after the bursting of the Monsoon they all came out. From this it would appear that of each season's pupæ some were hatched at once, some are brought out by the spring showers or heavy dews of February and March, and the

rest remain till June. Do the butterflies which come out in August and March lay eggs, and, if so, what becomes of them?

The larva of this species is not so thick proportionally at the fourth segment as those of *P. Dason*, *Sarpedon* and *Agamemnon*, and is somewhat quadrangular. It has four pairs of spines, which are small, but sharp. The most usual colour is black, banded on the sides with narrow white stripes, except on the first three or four segments and the last, on which there is more or less rusty-red; but the shade varies very much, and in some the ground-colour is green. The pupa has the usual horn which characterizes this group, and also two short processes on the head, and is of some shade of earthy-brown. It is attached by the tail and a close band in crevices, or under stones and roots. We furnished our cages with bits of broken tiles, but several of the larvæ preferred the old clay nest of a wasp, into the empty cells of which they crept. This curious habit is of course connected with the hybernation which the majority of the pupæ undergo. Along with our larvæ of *P. Nomius* we found some of *P. Agamemnon* and *P. Dason*, and it is remarkable that while very many of these had been attacked by a large parasitic fly, the grub of which ate its way out and fell to the ground after the pupa had formed, *P. Nomius*, so much more conspicuous and feeding on the same tree, seemed to enjoy entire immunity from the pest." "We have since proved that *P. Nomius* remains for more than half the year, from the end of July till at least March, or oftener May, in the pupa state under stones and roots" (J. Davidson and E. H. Aitken, Journ. Bombay N. H. Soc. 1890, p. 364, *id.* 1896, p. 573).

DISTRIBUTION, HABITS, ETC.—In Ceylon, Mr. F. M. Mackwood records it as being found in the "low country only, and principally in the Northern provinces. Very scarce. Captain Hutchison obtained it in the Eastern province, in the plains and forest, in August. Taken only on one occasion, on a journey from Kandy to Trincomalie, associated with *Pap. Antiphates* and *Dason*, sitting in numbers on damp places on the road, dense forest being on both sides. Captain Wade also took it at Trincomalie" (Lep. Ceylon, i. 142). Dr. N. Manders found it "common and frequently abundant in the North Central Province and on the Trincomalie side of the Island. It is fond of setting in large numbers together on damp patches of sand. It flies in July and August, and again at the end of the year" (Journ. As. Soc. Beng. 1899, 223). Col. J. W. Yerbury obtained it at "Tamblegam and Trincomalie in September" (MS. Notes). In South India, Mr. H. S. Ferguson found it "rare in Travancore. One specimen only being taken at the foot of the Ashambu Hills" (Journ. Bombay N. H. S. 1891, 16). Mr. G. F. Hampson obtained "one specimen only in the Nilgiris, at 1,000 feet elevation" (Journ. As. Soc. Beng. 1888, 364). Mrs. Hamilton found and reared the larva in Saugor, in July, 1852, describing it as dark blue with brown ends and green underneath, six anterior and two posterior

spines; pupa suspended by tail and medial band; imago emerged in August (MS. Notes). Messrs. J. Davidson and E. H. Aitken record "this butterfly was very common in the N. Kanara District of Bombay, in 1889, in March, June, and July; it frequented one particular spot about half-way up the Goodhally Hill; elsewhere we seldom met with it. On June 23rd we discovered the larva on a jungle tree (since identified as *Saccopetalum tomentosum*, N. O. Anonaceæ) and literally collected hundreds. By the end of July these had all become pupa" (J. Bombay, N. H. S. 1890, 364). "The butterfly is plentiful enough where it occurs, much more so, however, in some years than others, but it is very local, and its appearance is limited to the hot season and the first two months in the rains. More than half the year, from the end of July till at least March, or oftener May, is passed in the pupa state under stones and roots" (*id. l.c.* 1896, 579). A specimen from Belgaum, Bombay, is in the British Museum. Mr. J. Beetham obtained it in the Central Provinces (*l.c.* 1891, 330). Col. C. Swinhoe records it from "Mount Aboo, Central Provinces" (Tr. Ent. Soc. 1893, 313). He also possesses a specimen from Ranchi, Chota Nagpur, Lower Bengal. Mr. W. C. Taylor found it "very common in some places in Khorda, Orissa" (List, 1888, 16). The late Edw. Blyth writes that it "abounds in the vicinity of Calcutta and other parts of Bengal, during the dry hot season" (MS. Note). Mr. J. Rothney found it "rather uncommon in the Calcutta District. It frequents the flowers of *Durantia Plumieri*" (Ent. Mo. Mag. 1882, 33). Mr. L. de Nicéville says, "This species comes out in profusion, in the neighbourhood of Calcutta, in March, and is the only single-brooded species in Calcutta with which I am acquainted. The larva feeds on *Polyalthia longifolia*" (J. As. Soc. Beng. 1885, 51).

Of our illustrations on Plate 477, fig. 1, *larva* and *pupa*, is from the drawings of Mrs. Hamilton, made at Saugor in 1852; fig. 1a, also *larva* and *pupa*, is copied from Messrs. Davidson and Aitken's published drawings; fig. 1, b, c is from a Ceylon male; 1d from an Indian female, and 1e from a Barrackpur female.

PATHYSA PERNOMIUS (Plate 478, fig. 1, 1a, b, ♂).

Papilio Nomius, form temp. *Pernomius*, Fruhstorfer, Berl. Ent. Zeit. 1902, p. 202.

Papilio (Pathysa) Nomius, Elwes, Journ. As. Soc. Beng. 1886, p. 437. de Nicéville, Sikkim Gaz. 1894, p. 174. Adamson, List of Burma Butt. 1897, p. 48.

Papilio Nomius, de Nicéville, J. Bombay N. H. Soc. 1890, p. 387. Watson, *id.* 1891, p. 54.

Papilio Nomius Swinhoei (part), Rothschild, Nov. Zool. ii. p. 422 (1895).

Male and female. Upperside. *Forewing* with comparatively broader black bands than in typical *Nomius* from Ceylon and S. India. *Hindwing* also with broader black marginal band, the inner-interspaces of the caudal area being almost or entirely black, and the two lower subanal white spots smaller. Underside. Bands on both

wings paler and brighter ochreous than in *Nomius*; and on the hindwing the basal band has a black streak along the precostal vein, which latter is also present in *P. Swinhoei*, but not in *Nomius*; the marginal band is also inwardly-edged with more or less well-defined black lunules.

HABITAT.—Sikkim; Burma; Upper Tenasserim; Shan States.

DISTRIBUTION.—Col. C. Swinhoe possesses two males from Sikkim. A single specimen was obtained in Sikkim by Mr. Otto Möller. We possess specimens from Pegu, and from Thoungyeen, Upper Tenasserim, the latter taken by Col. C. T. Bingham in February. Col. Swinhoe also has it from Pegu. Capt. E. Y. Watson took it at "Tiling, from March to May" (J. Bombay N. H. S. 1891, 54). He also writes, "The Eastern race of *Nomius* (Swinhoei Moore) was common in the Upper Chindwin District, Burma, from March to May, and Capt. Longe also obtained it commonly at 2,000 feet elevation, on the Manipur River in February" (*id. l.c.* 1897, 672). Specimens from Tilin Yaw and Toungoo, taken by Capt. E. Y. Watson, are in the British Museum. Col. C. H. E. Adamson has taken it in "Akyab, Moulmein, and Bhamo, and says it affects the borders of tanks and moist places in otherwise dry forests, in March, April, and May, the females being very uncommon" (List, 1897, 48).

We possess four males from the Upper Mekong, Shan States, taken by Mr. J. Roberts, C.E.

Of our illustrations on Plate 478, fig. 1, 1a is from a Pegu male, and fig. 1b from a Shan States male.

INDO-MALAYAN SPECIES.—*Pathysa Antiphates* (Papilio Antiphates, Cramer, Pap. Exot. i. p. 113, pl. 72, fig. A, B (1775). Jablonsky and Herbst, Nat. Schmett. iii. p. 151, pl. 43, fig. 1, 2. Rothschild, Nov. Zool. ii. p. 410 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 197. *Habitat.* S.E. China; Tonkin; Hong Kong; Hainan.—*Pathysa Antiphonus* (Pap. Antiphates, subsp., Antiphonus, Fruhstorfer. Soc. Ent. 1902, p. 170; *id.* Berl. Ent. Zeit. 1902, p. 198. *Habitat.* Nias.—*Pathysa decolor* (Pap. Antiphates, var. decolor, Staudinger, Iris, i. p. 279 (1888). Semper, Philip. Tagfalt. p. 285, pl. 48, fig. 3, ♂ (1893). Rothschild, *l.c.* p. 413 (1895). Pap. Ant. Palawanicus, Eimer, Artb. Schmett. p. 149 (1889). Pap. Ant. tigris, Semper, *l.c.* p. 284, pl. 48, fig. 2, ♀. Pap. Ant. Euphratoides, Eimer, *l.c.* p. 133, pl. 2, fig. 4 (1889). Semper, *l.c.* p. 284, pl. 48, fig. 1, ♀. *Habitat.* Palawan; Mindanao; Banguay.—*Pathysa Euphrates* (Pap. Euphrates, Felder, Wien. Ent. Mon. 1862, p. 283; *id.* Reise, Nov. Lep. i. p. 54, pl. 11, fig. D (1863). Eimer, *l.c.* p. 125, pl. 2, fig. 5 (1889). Semper, *l.c.* p. 285, pl. 48, fig. 4, 5, 6, ♂ ♀. Pap. Ant. Euphrates *et aber.* atratus, Rothschild, *l.c.* pp. 413, 414 (1895). *Habitat.* Luzon; Mindoro.—*Pathysa Hermocrates* (Pap. Hermocrates, Felder, Verh. Z. B. Ges. Wien. 1864, p. 302; Reise, Nov. Lep. i. p. 57, pl. 12, fig. E, ♂ (1865). Oberthür, Et. Ent. iv.

p. 63 (1879). Staudinger, *Iris*, i. p. 14 (1888); *id.* ii. p. 14, ♀ (1889). Oberthür, *l.c.* xvi. p. 4. (1893). Eimer, *Artb. Schmett.* p. 161, pl. 3, fig. 2 (1889). Semper, *Philip. Tagfalt.* p. 283 (1892). Fruhstorfer, *Berl. Ent. Zeit.* 1902, p. 200. *Habitat.* Philippines; Palawan; Tonkin.—*Pathysa Swinhoei* (Pap. Swinhoei, Moore, *P. Z. S.* 1878, p. 697. Holland, *Tr. Amer. Ent. Soc.* 1887, p. 123. Oberthür, *Et. Ent.* xvii. p. 4 (1893). Pap. *Nomius Swinhoei* (pt.), Rothschild, *Nov. Zool.* ii. p. 422 (1895). Fruhstorfer, *l.c.* 1902, p. 201. *Habitat.* Hainan; Tonkin.

Genus DEORIS.

Papilio (sect. 21, subsect. B), Felder, *Verh. Z. B. Ges. Wien.* 1864, pp. 302, 346.

Papilio (part), Doubleday and Hewitson.

Papilio (group 32), Rothschild, *Nov. Zool.* ii. p. 417 (1895).

IMAGO.—Male. *Forewing* short, triangular; glossy; semi-transparent apically; costa arched, apex pointed, exterior margin oblique and almost straight; cell long and narrow. *Hindwing* triangular; exterior margin very oblique, sinuous, and with a long slender tail; abdominal margin folded and enclosing an elongated woolly scent-organ, the extreme margin very hairy. *Body* short, stout, hairy; antennæ short, club thick.

TYPE.—D. Agetes.

DEORIS AGETES (Plate 478, fig. 2, 2a, ♂, 2b, ♀).

Papilio Agetes, Westwood, *Arcana Entom.* ii. p. 93, pl. 55, fig. 1, 2 (1843). Doubleday and Hewitson, *Gen. D. Lep.* i. p. 15 (1846). Gray, *Catal. Lep. Brit. Mus.* i. p. 31 (1852). Moore, *Catal. Lep. Mus. E. I. Company*, i. p. 116 (1857). Felder, *Verh. Z. B. Ges. Wien.* 1864, pp. 302, 346. Oberthür, *Etud. Ent.* iv. p. 67 (1879). Staudinger, *Exot. Schmett.* i. p. 9 (1884). Elwes, *Trans. Ent. Soc. Lond.* 1883, p. 433. Eimer, *Artbild. Schmett.* p. 53, pl. i. fig. 8 (1889). Haase, *Unters. tib. Mim.* p. 32 (1893). Rothschild, *Nov. Zool.* ii. p. 417 (1895).

Papilio (Pathysa) Agetes, Elwes and de Nicéville, *Journ. As. Soc. Beng.* 1886, p. 437.

Pathysa Agetes, Swinhoe, *Tr. Ent. Soc. Lond.* 1893, p. 313.

IMAGO.—Male. Upperside pale olivescient-white. Cilia black. *Forewing* with a black extreme basal slender band, a broader transverse subbasal and a still broader inner-discal band extending decreasingly from the costa to submedian veinlet, an equidistant similar band beyond across the cell, and a short triangular stripe above end of the cell, which latter sometimes extends very slenderly down the discocellulars; followed by an outwardly oblique transverse submarginal band attenuating posteriorly and there coalescing with a marginal band; the basal, cell, and apical interspaces tinged with very pale olivescient-green, the apical interspaces being semi-transparent. *Hindwing* with the subbasal and medial band of the underside showing

through by semi-transparency; a black outer-marginal narrow band which widens posteriorly, including the tail, and ends upward at the abdominal angle in a broken more or less bright crimson black-edged spot, this band is also posteriorly inwardly bordered with grey scales and bears a triangular white anal spot below the crimson one, a similar white marginal spot in the angle of the upper median interspace, two grey-scaled lunules in the two lower median interspaces, and also a very slender streak in the subcostal interspaces. Underside. *Forewing* with similar black bands as on upperside, the basal and anterior interspaces olivescence tinted. *Hindwing* pale olivescence tinted; with a black basal, subbasal, and a medial band, coalesced posteriorly above the anal angle, the latter traversed anteriorly and posteriorly outwardly-bordered by crimson zigzag broken streaks, followed by a marginal black band with markings as on upperside. *Body* above blackish, beneath and palpi pinkish-white; abdomen with a black lateral band; thorax above laterally clothed with long silky grey hairs; collar and head above with a lateral pale crimson band; legs olivescence-grey; antennæ black.

Female. Upperside duller white than in male. *Forewing* with the black medial, cell, and oblique submarginal band somewhat broader, the medial band extending to below the submedian vein. *Hindwing* as in male. Underside as in male.

Expanse, ♂ 3, ♀ $3\frac{2}{10}$ inches.

HABITAT.—Sikkim; Assam; Khasias; Burma; Tenasserim; Shan States.

DISTRIBUTION.—Mr. L. de Nicéville records it as "occurring in Sikkim, in the outer valleys, such as the Sivoke, in April and May. It is rare, and probably single brooded" (Sikkim Gaz. 1894, 174). Mr. G. C. Dudgeon took it in Bhotan. Col. C. Swinhoe has received "several hundreds, all males, from the Khasia Hills" (Tr. Ent. Soc. 1893, 313). Col. C. H. E. Adamson obtained "two males in Burma, while imbibing moisture from damp sand, in February and March" (List, 1897, 48). Col. C. T. Bingham obtained specimens in Thoungyeen, Upper Tenasserim. We have two males from the Upper Mekong, Shan States, taken by Mr. R. Roberts, C.E.

INDO-MALAYAN SPECIES.—*Deoris Iponus* (Papilio Iponus, Fruhstorfer, Soc. Ent. 1902, p. 57). Pap. Agetes, Distant, Rhop. Malay. p. 469, pl. 42, fig. 8 (1886). *Habitat.* Malay Peninsula.—*Deoris insularis* (Pap. Agetes var. insularis, Staudinger, Iris, vii. p. 349 (1895). Rothschild, Nov. Zool. ii. p. 417 (1895). de Nicéville, Journ. As. Soc. Beng. 1895, p. 524. Pap. Kinabalensis, Fruhstorfer, l.c. 1902, p. 58. *Habitat.* Sumatra; Borneo.—*Deoris tenuilineatus* (Pap. Agetes subsp. tenuilineatus, Fruhstorfer, Soc. Ent. 1901, p. 90, id. Berl. Ent. Zeit. 1902, p. 199. *Habitat.* S. Annam.—*Deoris Stratiotes* (Pap. Stratiotes, Grose-Smith, Ann. Nat. Hist. 1887, p. 433. Honrath, Berl. Ent. Zeit. 1883, p. 319, pl. 6, fig. 3 (1888). Eimer, Artbild. Schmett. p. 151, fig. P. (1889). Rothschild, Nov. Zool. ii. p. 417 (1895). *Habitat.* Borneo.

Genus PAZALA.

Pazala, Moore, Desc. Lep. Coll. Atkinson, p. 283 (1888). Kirby, Allen's Nat. Libr. Butt. ii. p. 273 (1896).

Papilio (part), Doubleday and Hewitson.

Papilio (sect. 20, and 21, subsect. a), Felder, Verh. Z. B. Ges. Wien. (1864), pp. 301, 346.

Papilio (group 30), Rothschild, Nov. Zool. ii. p. 406 (1895).

IMAGO.—Male. *Forewing* short, broad, triangular, glossy, semi-transparent in the basal, costal, and apical interspaces; costa slightly arched towards the end, apex broad and obtuse, exterior margin slightly waved and scarcely oblique; cell long, broad at the end; discocellulars straight, upper longest; first subcostal branch short and anastomosed to the costal vein. *Hindwing* triangular; costa rather long and oblique, exterior margin very oblique, sinuous anteriorly and deeply scalloped posteriorly, with a long, very slender tail; cell long, somewhat broad across the middle; first subcostal branch emitted at more than half before end of the cell, second concave at the base; discocellular bent inward below the middle; abdominal fold feebly developed, no scent-organ present, the margin very hairy. *Body* short, thickly-clothed with fine long silky-hairs; front of head and palpi densely hairy; femora hairy beneath; antennæ very short, the club short and thick.

LARVA.—Cylindrical; head rather large; 3rd and 4th segments slightly tumid; 2nd, 3rd, and 4th segments each with two subdorsal pointed tubercles, and two similar tubercles on anal segment.

PUPA.—Suspended; head truncated; body tapering hindward; thorax with a frontal forward-projected lengthened point.

TYPE.—*P. Glycerion*.

PAZALA GLYCERION (Plate 479, fig. 1, 1a, ♂, 1b, ♀).

Papilio Glycerion, Gray, Zool. Misc. p. 32 (1831), *id.* Lep. Ins. of Nepal, p. 6, pl. 3, fig. 2 (1846).

Boisduval, Spec. Gén. Léop. i. p. 247 (1836). Doubleday and Hewitson, Gen. D. L p. i. p. 15 (1846). Moore, Catal. Lep. Mus. E. I. Company, i. p. 116 (1857). Heron, Ann. and Mag. Nat. Hist. 1899, p. 119.

Pazala Glycerion, Moore, Desc. Lep. Coll. Atkinson, p. 283 (1883).

Papilio Paphus, de Nicéville, Journ. Asiatic Soc. Bengal, 1886, p. 254, pl. xi. fig 6, ♂. Elwes, Trans. Ent. Soc. Lond. 1888, p. 432. Eimer, Artbild. Schmett. p. 46, fig. C, *et* p. 66 (1889).

Papilio (Pathysa) Paphus, de Nicéville, Sikkim Gazetteer, 1894, p. 174.

Papilio Mandarinus, subsp. *Paphus*, Rothschild, Nov. Zool. ii. p. 408 (1895).

IMAGO.—Male. Upperside white. *Forewing* glossy and semi-transparent in the interspaces of the basal, costal, and outer markings, and tinted with pale olivescent-green; with a black extreme basal band, an outwardly-oblique transverse subbasal and an inner-discal band, both extending from the costa to posterior margin, two equidistant

bands crossing middle of the cell, the outer one extending slightly up the base of second median branch, and the inner one sometimes less so up the first median; two partly-connected bands across apex of the cell; beyond is a discal transverse band which is wavy anteriorly and interiorly broken above the fourth median; followed by a submarginal narrower undulated band which is posteriorly coalesced to the discal band, and then by a broader marginal band; the outer veinlets from the third median upward are lined and edged with black from the cell outward, and the two lower medians also similarly black lined from the discal band. Cilia black, slightly edged with white. *Hindwing* with a black slender basal band extending obscurely along each side of the submedian vein to above abdominal angle; a parallel subbasal band obliquely crossing the cell and along the lower median veinlet, its lower end joining the former; a less defined and very slender waved medial band, extending from below the costa, across the cell, and thence obsolescently to the middle median veinlet, followed by a discal, a submarginal, and then a marginal slender interrupted band, each extending from the subcostal to the radial veinlet, the discal band from the latter inwardly joining the ends of the subbasal and basal bands; the broad anal interspace, from the radial, including the tail, being black—thus forming a large anal patch, which latter is inwardly speckled with grey scales, and outwardly has three marginal blue-scaled lunules, as well as two bright yellow spots from the abdominal angle, below which is a triangular white spot indented by an upwardly-oblique black point, a similar white spot being present above the upper median angle. Cilia, inclusive of that of the tail, and also its tip, white. Underside. *Forewing* similar to the upperside, except that the outer transverse bands are narrower and less prominent. *Hindwing* with the ground-colour pale olivescence-yellow, the black markings, similar to the upperside, but more distinctly defined, the veins outwardly from the cell being also black-lined, the medial band looped at its costal end and also at apex of the cell, the three outer slender interrupted bands each extending upward to the costal vein, the two yellow spots from abdominal angle paler, and the black anal patch with three irregular-shaped spots of the ground-colour above the blue-scaled lunules. *Body* above, from frontal tuft, covered laterally with long fine silky grey hairs, and dorsally with blackish hairs; palpi white; sides of thorax beneath black; thorax and abdomen beneath covered with long grey hairs, the latter with a lateral black streak; legs grey, femora above blackish; antennæ black.

Female. Upper and underside similar to the male.

Expanse, ♂ 3 to $3\frac{1}{2}$, ♀ $3\frac{3}{4}$ inches.

HABITAT.—Nepal; Sikkim; Assam; N. Chin Hills, Upper Burma.

DISTRIBUTION.—The Nepal type specimen, from Gen. Hardwicke's collection, is in the British Museum, also both sexes from Sikkim, taken in April by Mr. G. C. Dudgeon; males from Assam, from Capt. E. Y. Watson's collection, and also from the Khasia

Hills. We also possess it from Nepal, taken by Gen. G. Ramsay, and others from Sikkim. Mr. H. J. Elwes records "a dozen male specimens taken in Sikkim in May, June, and July, some of them near Mongpo and some on the top of Sinchul. Mr. Möller says its range is from 3,000 to 7,000 feet elevation, but as far as I can judge, it is found at higher elevations than *Glycerion* [Sikkima], and is more of a temperate than a tropical species" (Tr. Ent. Soc. 1888, 432). Mr. L. de Nicéville says it "occurs in Sikkim from 3,000 to 7,000 feet, from May to July" (Sikkim Gaz. 1894, 174). Captain E. Y. Watson records "a single not quite typical male of *Paphus* was obtained in the N. Chin Hills at 7,000 feet elevation, in April. Several other specimens were noticed at the same time flying round the tops of trees in copses" (J. Bombay N. H. Soc. 1897, 672).

PAZALA SIKKIMA (Plate 479, fig. 2, 2a, ♂, 2b, ♀).

Papilio Sikkima, Heron, Ann. and Mag. Nat. Hist. 1899, p. 120.

Papilio Glycerion, Elwes, Trans. Ent. Soc. Lond. 1888, p. 432. Eimer, Artbild. Schmett. p. 66, pl. 1, fig. 2 (1889). Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 313.

Papilio Glycerion (form a), Rothschild, Nov. Zool. ii. p. 407 (1895).

IMAGO.—Male. Upperside white. *Forewing* with similar black bands and black-edged anterior veins as in *P. Glycerion*, the narrow submarginal band being straighter in its course. *Hindwing* with the basal bands very slender and obsolete posteriorly, the three outer interrupted bands very slender, the inner or discal being either obsolete or slightly apparent only in the radial interspace, the submarginal also being more or less obsolescent in the subcostal interspace; the black anal patch narrower, its yellow spots not definitely separated, the lower anal white spot quadrate in shape and its indented black point slightly downwardly-oblique. Underside. *Forewing* with less prominent markings, as on upperside. *Hindwing* with the ground-colour olivescence-yellow, darker than in *Glycerion* and *Cashmirensis*, the basal, and catenulated discal band, the outer bands, and the anal markings, similar to those in *Cashmirensis*.

Female. Upperside and underside similar to the male; the anal yellow spots on the hindwing being brighter yellow.

Expanse, ♂ $2\frac{6}{10}$ to 3, ♀ 3 inches.

HABITAT.—Nepal; Sikkim; Assam.

DISTRIBUTION.—Mr. H. J. Elwes records this species as not very abundant in Sikkim, but occurs at about 2,000 to 4,000 feet elevation in May and June. I saw it on several occasions in the valleys below Mongpo in those months, but found it difficult to take, on account of its very quick flight" (Tr. Ent. Soc. 1888, 432). Mr. L. de Nicéville says it is "probably single brooded, and occurs in Sikkim, at low

elevations in May and June" (Sikk. Gaz. 1894, 174). Mr. G. C. Dudgeon took it in Sikkim in March and April. Specimens from the Khasia Hills, from Capt. E. Y. Watson's collection, are in the British Museum. Examples from Cherra Punji, Shillong, and the Jaintia Hills, Assam, are in Mr. W. Rothschild's collection. Col. C. Swinhoe records it from Shillong (Tr. Ent. Soc. 1888, 313).

PAZALA CASHMIRENSIS (Plate 480, fig. 1, *larva* and *pupa*; 1a, b, ♂, 1c, d, ♀).

Papilio Glycerion, subsp. *Caschmirensis*, Rothschild, Nov. Zool. ii. p. 407, ♂ (1895). Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 595, pl. W, fig. 25, a, b, c, *larva* and *pupa*.

Papilio Caschmirensis, Heron, Ann. and Mag. Nat. Hist. 1899, p. 120.

Papilio Glycerion, Westwood, Arcana Ent. ii. p. 24, pl. 55, fig. 3, ♂ (1843). Robson, Journ. Bombay N. H. Soc. 1895, p. 497, *larva* and *pupa*.

IMAGO.—Male. Upperside white; the basal, costal, and apical area less glossy and transparent than in typical *Glycerion*. Both wings with similar but less prominent black markings. *Forewing* with the discal and submarginal transverse band both narrower and disconnected posteriorly, the former not reaching the posterior angle and the latter not reaching the lower median veinlet; the marginal band is also more attenuated posteriorly, the anterior veins being slender and not black-edged. *Hindwing* with the basal-marginal and subbasal bands narrower, much less defined, and obsolescent posteriorly; a medial and an outer-medial waved line of the underside being visible by transparency; the discal, submarginal, and the marginal band is also more slender and less defined, these latter being posteriorly nearer together and thus much restricting the width of the anal black patch, the two yellow spots being paler and less defined in shape, and the white triangular anal spot below is indented by a black downwardly-oblique point. Underside. *Forewing* similar to the upperside, the markings being paler, and the marginal band very slender. *Hindwing* with the ground-colour pale olivescient-yellow; the blackish basal, subbasal, the catenulated medial band, and the anal black patch with its white anal spot indented by a downwardly-oblique black point, the two yellow spots more defined than on upperside; the interspaces of the discal catenulated-band being also pale yellow.

Female. Upper and underside similar to the male.

Expanse, ♂ $2\frac{8}{10}$, ♀ 3 inches.

LARVA.—Cylindrical; head rather large; 3rd and 4th segment slightly tumid; 2nd, 3rd, and 4th segments each with two subdorsal pointed tubercles, and two similar tubercles on anal segment; colour green; head and legs pale ochreous-green.

PUPA.—Suspended. Head truncated; body tapering hindwards; thorax with

a frontal forward-projected lengthened point; colour bright green, with a yellow longitudinal lateral line and a dorsal line from the frontal point divaricating subdorsally hindward from the thoracic segment. (Described from Mackinnon's drawing.)

HABITAT.—N. Kashmir; N.-W. Himalayas.

LIFE HISTORY.—“LARVA; when full-fed, $1\frac{1}{8}$ to $1\frac{1}{4}$ inch in length; the 4th and 5th segments are the thickest, the larva tapering from the 5th segment to the 13th. Colour green, of the same shade as the food-plant, the leaves of *Machilus odoratissima*. The whole larva is covered with minute black dots, except on the anal segment; the 3rd segment is bordered anteriorly by a narrow ochreous ridge, which surmounts the head when drawn in, and is continued in unbroken spiracular lines to the tail; this ridge or hood is furnished with two short, blunt, black, subdorsal spines; the 4th and 5th segments are furnished each with two subdorsal vermilion tubercles armed with a short black spine; the last segment is bifurcated, and the points are yellow tipped with black; these appendages project outwards; the legs, claspers, and abdomen are of a whitish-green.

PUPA.—1 inch long, of a brighter green than the larva; marked longitudinally with four ochreous-yellow curved bars.

The larva here described was found in Masuri, N.-W. Himalayas, in June, 1894. The pupa was kept in Masuri from June to October, and then brought down to Bankipur in the plains of Behar. The imago emerged on March 21st, 1895” (Mrs. S. Robson, *l.c.*).

DISTRIBUTION.—The type specimens, in Mr. W. Rothschild's collection, are labelled N. Kashmir. Mr. P. W. Mackinnon records it as “very common in Masuri at about 5,000 feet elevation, in March and April, the larva feeding on *Machilus odoratissima*, N. O. Laurineæ” (*l.c.* p. 595). In the late Mr. J. H. Leech's collection, now in the British Museum, are specimens from Kujiar, 6,000 feet elevation, taken in April by Capt. MacArthur, also from Sultanpur, Kulu, taken by Capt. Graham Young.

Of our illustrations on Plate 480, fig. 1, larva and pupa, are copied from Mr. Mackinnon's published drawings, and figs. 1a—d are from the male and female types in Mr. W. Rothschild's collection.

CHINESE SPECIES.—*Pazala Mandarina* (Papilio Mandarinus, Oberthür, Etudes Ent. iv. p. 115 (1879). Leech, Butt. of China, etc. p. 520 (1893). Rothschild, Nov. Zool. ii. p. 408 (1895). *Habitat.* W. China.—*Pazala Eurois* (Pap. Eurois, Leech, *l.c.* p. 521, pl. 32, fig. 3, ♂ (1893). Rothschild, *l.c.* p. 408 (1895). *Habitat.* C. China.—*Pazala Panopæa* (Pap. Panopæa, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1900, p. 172, pl. E, E, fig. 20. *Habitat.* W. China.—*Pazala Alebion* (Pap. Alebion, Gray, Catal. Lep. Brit. Mus. i. p. 30, pl. 13, fig. 6, ♂ (1852). Rothschild, *l.c.* p. 409. *Syn.*

Pap. Mariesi, Butler, Ann. Nat. Hist. 1881, p. 33, pl. 4, fig. 4, ♂. Leech, *l.c.* p. 552. *Habitat.* C. China.—*Pazala Tamerlana* (Pap. Tamerlana, Oberthür, Etud. Ent. ii. p. 13, pl. 2, fig. 1 (1876); *id.* iv. p. 64 (1879). Leech, *l.c.* p. 521, ♂ ♀ (1893). Rothschild, *l.c.* p. 409. *Habitat.* W. China.—*Pazala Parus* (Pap. Parus, de Nicéville, Journ. Bombay N. H. Soc. 1900, p. 172, pl. E, E, fig. 21. *Habitat.* W. China.

Genus IPHICLIDES, Hübner, Verz. bek. Schmett. p. 82 (1816). Stephens, Illust. iv. p. 404 (1835). Scudder, Rev. Amer. Butt. p. 34 (1872). Kirby, Allen's Nat. Hist. Butt. ii. p. 274 (1896). Papilio (sect. 25) Felder, Verh. Z. B. Ges. Wien. pp. 303, 348 (1864). Papilio (group 29) Rothschild, Nov. Zool. ii. p. 402 (1895). *Forewing* short, broadly triangular, costa slightly arched, apex almost pointed, exterior margin slightly oblique; cell broad; upper discocellular shortest, lower concave; subcostal branches free from the costal vein. *Hindwing* short, prolonged and narrowed hindward; exterior margin sinuous and produced into a long narrow tail at end of upper median; cell broad in the middle and pointed at end; first subcostal at one-third before end of the cell, second concave at the base; discocellulars long and bent inward very close to lower end of the cell, radial from its angle. *Body* short, stout; antennæ short, with a stout spatular club. TYPE. I. Podalirius, Linn.—*Iphiclides Podalirinus* (Papilio Podalirinus, Oberthür, Etudes Entom. xiii. p. 37, pl. 9, fig. 99 (1890). Leech, Butt. of China, p. 519 (1893). Rothschild, Nov. Zool. ii. p. 405 (1895). *Habitat.* Western China.

Genus PAPILIO.

- Papilio* (part), Linnæus, Syst. Nat. ed. x. p. 458 (1758); ed. xii. p. 744 (1767). Fabricius, Ent. Syst. iii. i. p. 258 (1793).
Papilio, Linnæus, Fauna Suec. p. 267 (1761). Poda, Ins. Mus. Græc. p. 61 (1761). Fuessly, Verz. Schweiz. Ins. p. 28 (1775).
Achivus, Barbut, Gen. Ins. Linné, p. 169 (1781). Kirby, Allen's Nat. Hist. Butt. ii. p. 286 (1896).
Papilio (sect. e, Eques), Cuvier, Tabl. Elem. d'Hist. Nat. p. 591 (1798).
Papilio (sect. c), Eques pt.), Lamarck, Syst. Nat. Anim. p. 283 (1801).
Pieris (part), Schrank, Faun. Boica, ii. i. pp. 152, 160 (1801).
Papilio (Eques, pt.), Latreille, Hist. Nat. Gen. Cr. et Ins. iii. p. 387 (1802).
Papilio (part), Latreille, *l.c.* xiv. p. 108 (1805).
Papilio, Latreille, Consid. Gén. Anim. (Ins.) p. 440 (1810). Samouelle, Ent. Comp. p. 235 (1819).
 Stephens, Illust. Brit. Ent. Haust. i. p. 6 (1827). Westwood, Intro. Class. Ins. ii. Gen. Syn. p. 87 (1840).
Princeps, Hübner, Tentamen, p. 1 (1806). Scudder, Hist. Sketch Gen. Butt. p. 257 (1875).
Jasoniades (pt.), Hübner, Verz. bek. Schmett. p. 83 (1816).
Amaryssus, Dalmann, Kongl. Vet. Acad. Handl. xxxvii. pp. 60, 85 (1816). Scudder, Syst. Rev. Amer. Butt. p. 45 (1872).

Papilio (Eques, pt.), Latreille, Cuvier's Rég. Anim. iii. p. 549 (1817); *id. l.c.* v. p. 375 (1829).

Papilio (sect. 51), Felder, Verh. Z. B. Ges. Wien. 1864, pp. 314, 362.

Papilio (group 5, pt.), Rothschild, Nov. Zool. ii. p. 272 (1895).

IMAGO.—*Forewing* triangular; costa slightly arched, exterior margin oblique and slightly uneven; cell somewhat fusiform; upper discocellular shortest; first subcostal branch emitted at one-third and second at one-fourth before end of the cell. *Hindwing* short, broad; costa very oblique, exterior margin sinuous, and with a moderately long tail which is broad at the base and acute at the tip; cell broad; first subcostal emitted at nearly half before end of the cell, second branch straight at the base. *Body* short, thick; thorax and head densely, and abdomen slightly, pilose; femora densely pilose; antennæ short, the club very stout.

LARVA.—Adult; smooth; anterior segments somewhat thickened; furnished with two retractile tentacula on the anterior segment.

PUPA.—Head obtusely cleft in front; thorax laterally angled, and with a dorsal obtusely-pointed projection.

TYPE.—P. Machaon.

PAPILIO ASIATICA (Plate 481, fig. 1, *larvæ* and *pupæ*, 1a, b, ♂, 1c, ♀; Plate 482, fig. 1, ♂).

Papilio Machaon, var. *Asiatica*, Ménétries, Enum. Corp. Anim. Mus. Petrop. Ins. i. p. 70 (1855).

Doherty, Journ. As. Soc. Beng. 1886, p. 136. Butler, Ann. Nat. Hist. 1888, p. 205.

Alpheraky, Rom. Mem. Lep. v. p. 60 (1889). Heyne, in Rühl, Gross-Schmett. p. 694 (1895).

Papilio Asiatica, Moore, Proc. Zool. Soc. Lond. 1882, p. 258. Butler, *id. l.c.* 1886, p. 377, *ib.* Ann. Nat. Hist. 1888, p. 205.

Papilio Machaon, Kollar, Hügel's Kaschmir, iv. pt. 2, p. 406 (1844). Gray, Lep. Ins. Nepal, p. 6, pl. 3, fig. 1 (1846). Hutton, Trans. Ent. Soc. Lond. 1847, p. 47. Moore, Catal. Lep. Mus. E. I. C. i. p. 111 (1857). Lang, Ent. Mo. Mag. 1864, p. 101. Stoliczka, Verh. Z. B. Ges. Wien. 1866, p. 866.

Papilio Machaon Sphyrus (pt.), Rothschild, Nov. Zool. ii. p. 275 (1895).

Papilio Machaon Sphyrus, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 592.

IMAGO.—Male. Upperside black. Cilia alternated with yellow. *Forewing* with the base densely irrorated with yellow scales; a pale yellow outwardly-oblique bar crossing outer third of the cell, a similar bar within apex of the cell, an inner-discal oblique transverse macular band widening posteriorly, the portions being broadly divided by the black veins, followed by a submarginal row of small more or less oblong spots, the outer-discal black area being medially-traversed more or less by minute yellow scales. *Hindwing* with the black abdominal border speckled with yellow scales, and clothed with long yellowish-grey hairs; a broad yellow inner band divided by narrow black veins, the portions outside apex of the cell being sometimes small and disconnected, followed by a submarginal row of broad yellow

lunate spots, and a prominent deep red anal spot, which latter is inwardly-edged by a blue-scaled lunule; the outer-discal black area being medially traversed generally by a more or less lunularly-disposed cluster of blue scales between the veins; cilia between the veins edged inwardly by a slender yellow lunule. Underside. *Forewing* with pale yellow basal interspaces, cell bars, transverse discal band, and a broad submarginal continuous band, the veins and the margins of the markings only being black; the outer-discal interspace being also almost completely filled up with densely packed yellow scales. *Hindwing* pale yellow, the veins only and the edges of the outer markings being black; the anal ocellus paler red, the end of upper and middle and sometimes of each yellow interspace often being also red tinted; the entire transverse discal interspaces densely covered with yellow scales and inwardly thickly speckled with violet-blue scales. *Body* above black, beneath and sides of abdomen pale yellow; sides of thorax above, frontal tuft and palpi yellow; legs above blackish, beneath yellowish, the tarsi being blackish; antennæ black.

Female. Upperside similar to the male. *Forewing* with the yellow cell-bars broader, the discal band generally somewhat narrower, and the submarginal spots larger. Underside similar to the male.

Expanse, $3\frac{1}{4}$ to $3\frac{1}{2}$ inches.

LARVA and PUPA (see Plate 481).

HABITAT.—North-Western and Central Himalayas.

LIFE HISTORY.—EGG. “Small, globular, and of a somewhat bluish-green colour. Laid in considerable numbers on the Fennell, distributed over the numerous ends of the branches,—but, on the Hemlock I never detected the eggs, though larvæ were hatched from every bunch of flowers I obtained nearly. The first batch of eggs are evidently laid early in April, and come out in May. The May batch must be laid on some other plant than the Hemlock, which barely lasts out the month. The Fennell is no doubt an adopted food, not being indigenous, but found in nearly every native garden.

YOUNG CATERPILLAR.—“Newly born. Head large, shining black and hirsute. Body spined, the spines longest on the thorax, graduating and very much reduced in length on the 7th and 8th segment, and longer again from thence to the anal segment. All the spines thickly branched, and much swollen at the base. A dorsal white patch on the 7th and 8th segment (on which the spines also are white); the rest of the surface ochreous-green. Anterior margin of the 2nd segment and spiracular inflation light coloured. True legs shining black; the claspers dark coloured with light tips. *First Molt*.—Larva pale ochreous spotted with black, with the dorsal white patch on the 7th and 8th segment, and whitish about the vent. Dorsal spines velvety-black, except those included in the white patch, which have black branches. The lateral line of tubercles above the spiracular inflation



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1^a

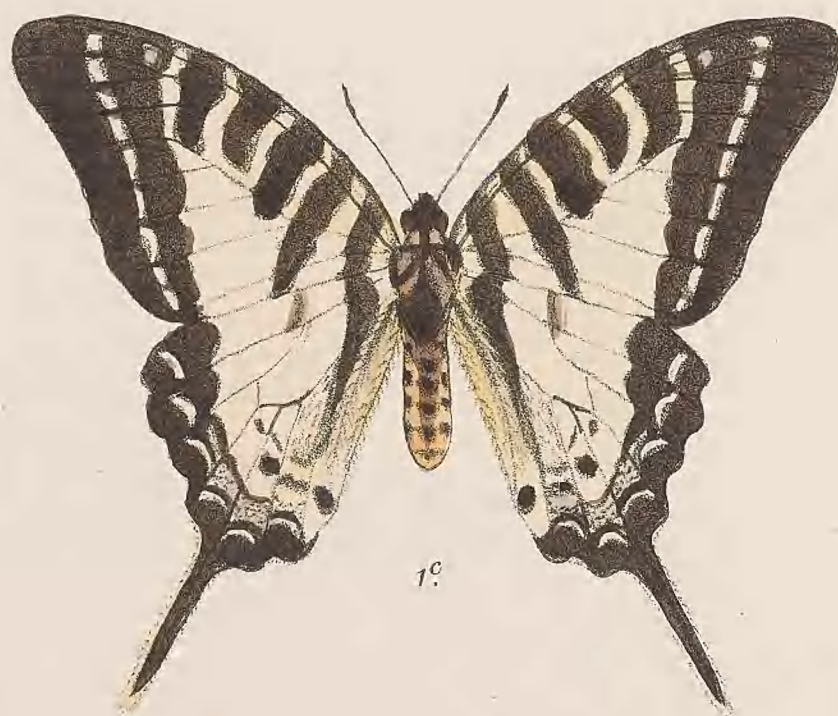


2^a



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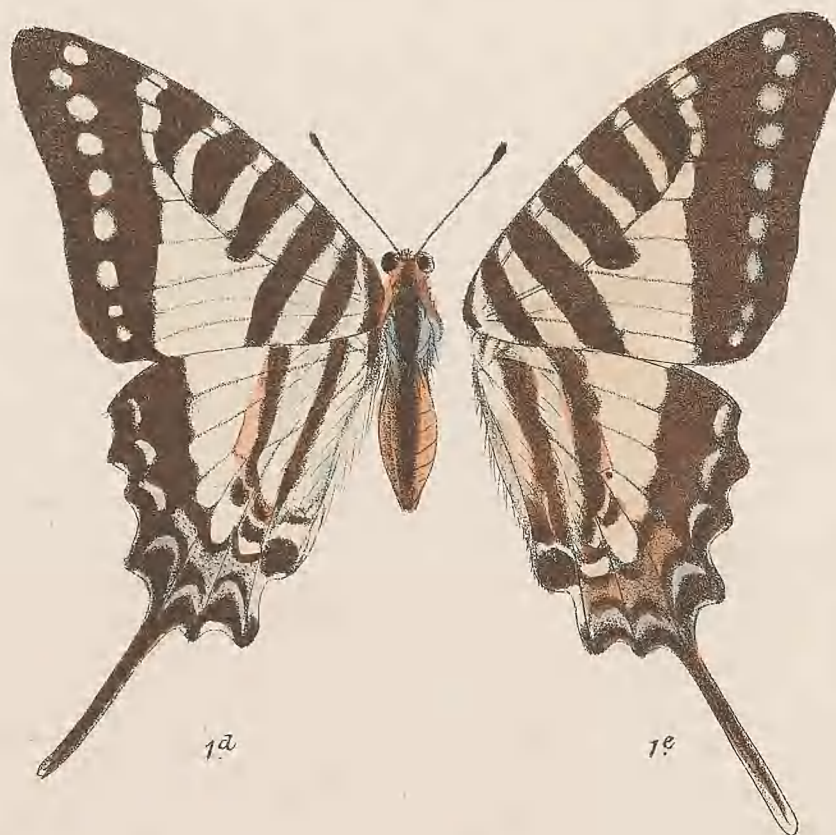
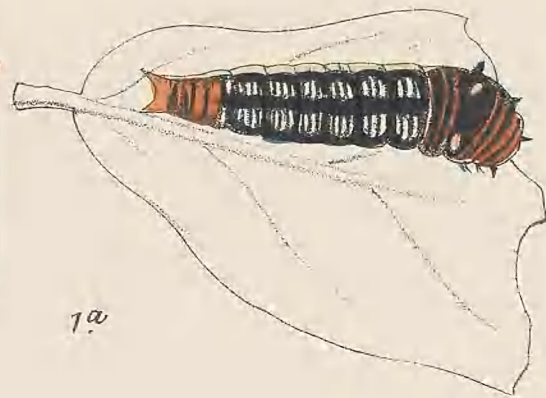
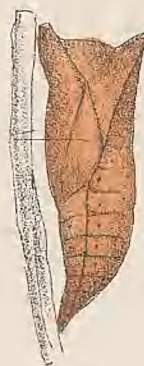
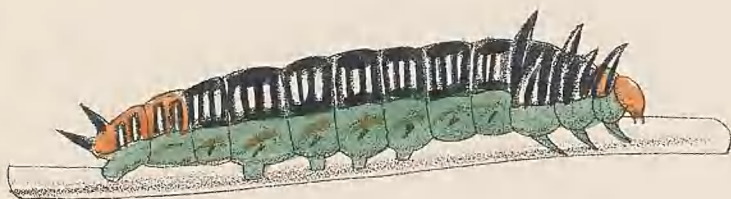
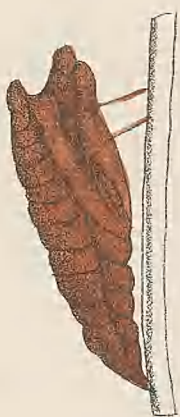
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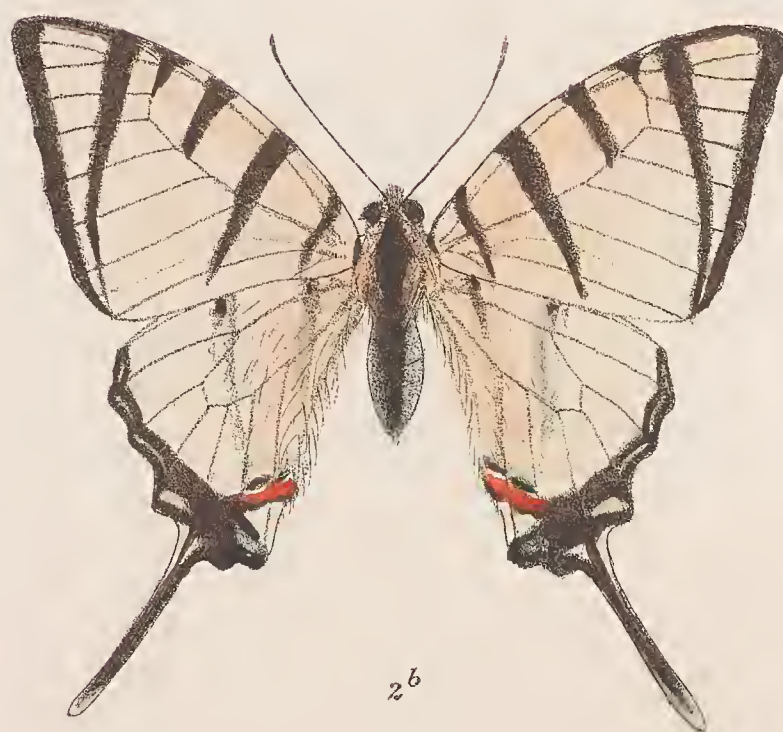
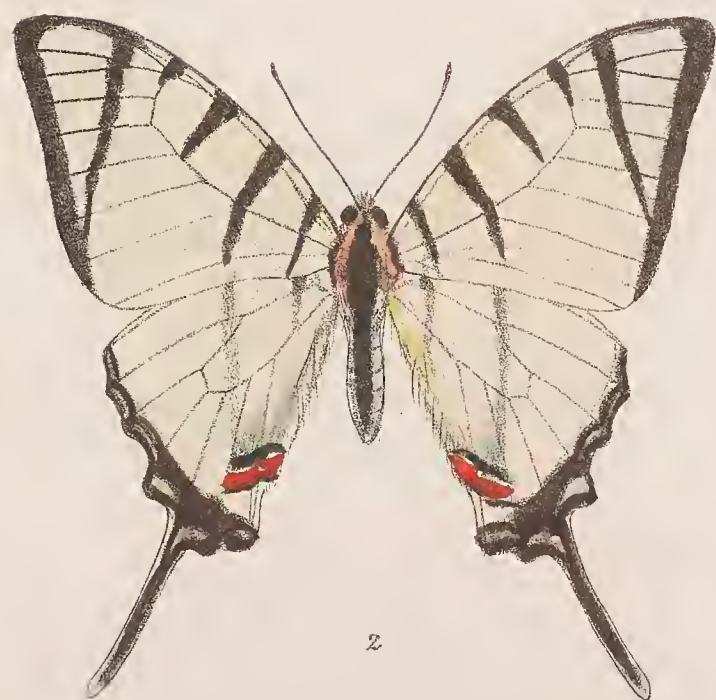
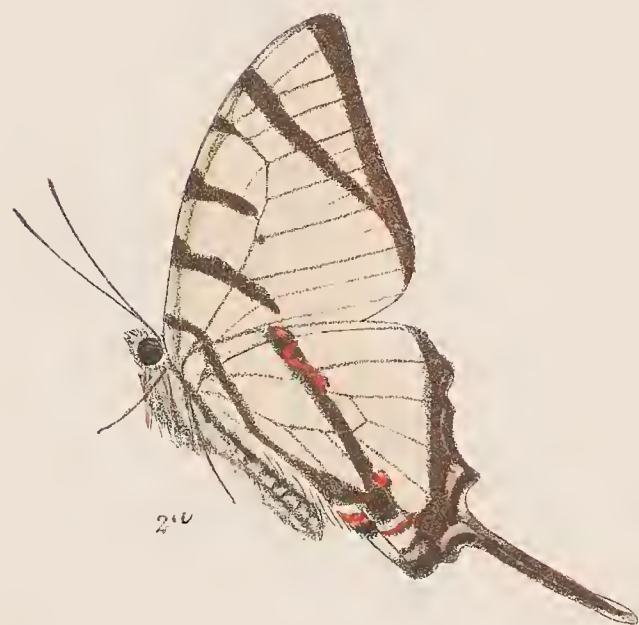


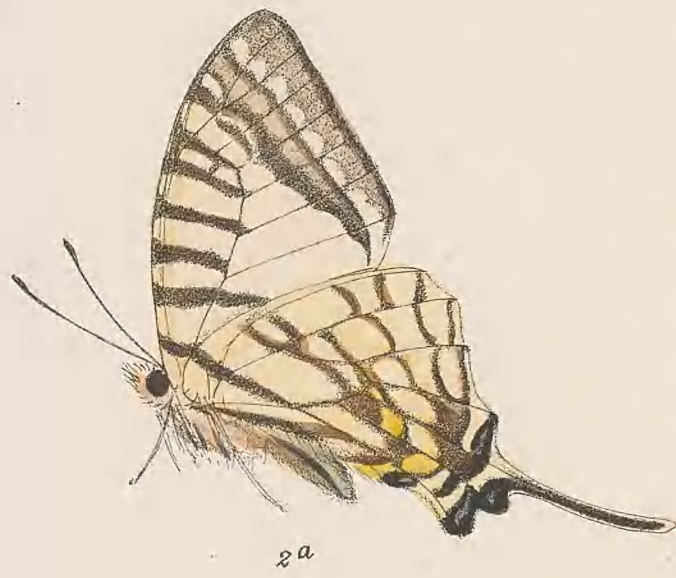
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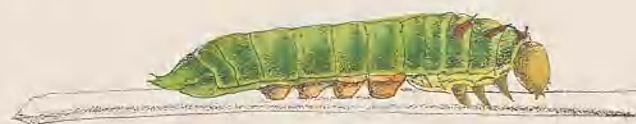
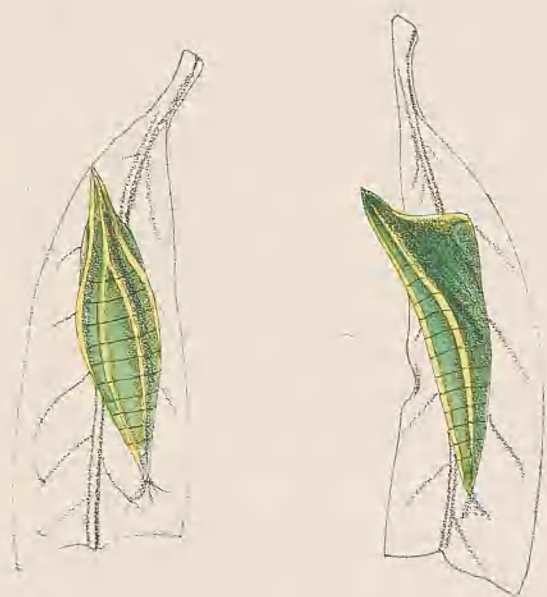
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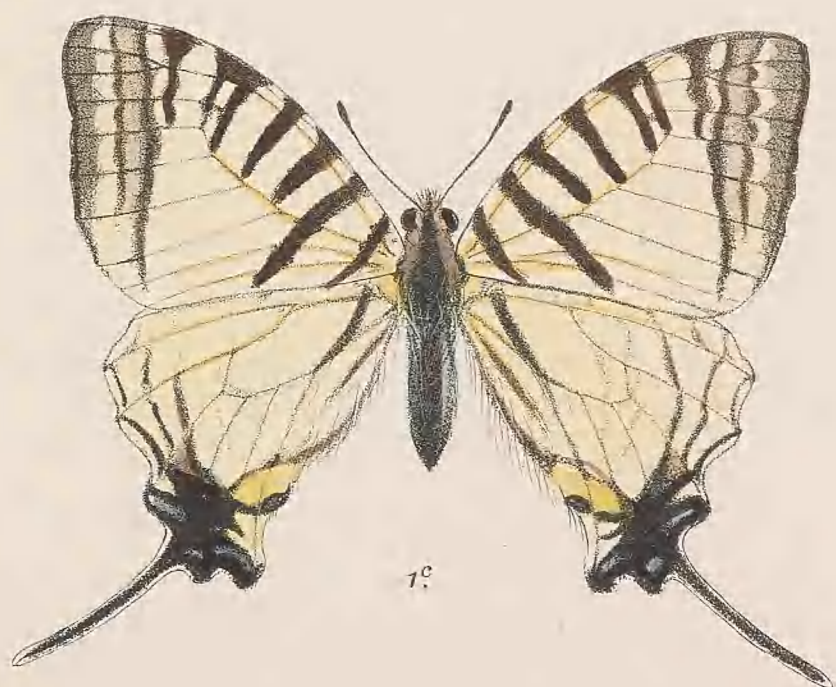


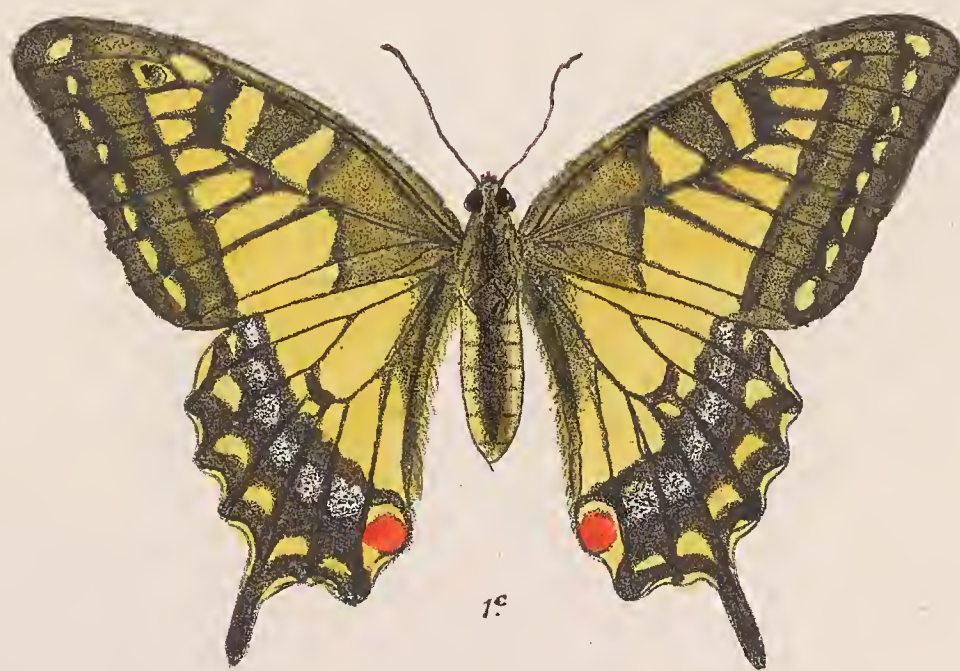






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**PARANTICOPSIS XENOCLES** (Plate 516, fig. 2, ♂, 2a, ♀).

*Papilio Xenocles*, Doubleday, in Gray's Zool. Misc. p. 74 (1842). Westwood, Arcana Ent. ii. p. 127, pl. 79, fig. 2, ♂ (1845). Doubleday and Hewitson, Gen. D. Lep. i. p. 20, pl. 1a, fig. 2 ♂ (1846). Gray, Catal. Lep. B. M. i. p. 71 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 90 (1857). Felder, Verh. Z. B. Ges. Wien. 1864, pp. 308, 354. Oberthür, Etud. Ent. iv. p. 100 (1879). Staudinger, Exot. Schmett. i. p. 6, pl. 3, ♂ (1884). Butler, Ann. and Mag. Nat. Hist. 1885, p. 384. Fruhstorfer, Berl. Ent. Zeit. 1902, p. 229.

*Papilio (Paranticopsis) Xenocles*, Wood-Mason and de Nicéville, Journ. As. Soc. Bengal, 1887, p. 376.

*Paranticopsis Xenocles*, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 315.

IMAGO.—Male. Upperside black; cilia very slenderly alternated with white. *Forewing* with a small greyish-white spot at base of the costa, four elongated upwardly-oblique cell-streaks, and a spot between the upper pair at lower end of the cell, four, or sometimes only three rounded spots—the lowest being absent—outside end of the cell, followed by a discal series of broad streaks with indented outer ends, the upper five being short, the others elongated, that between the lower median and submedian divided by a black curved line; beyond is a submarginal row of nine rounded spots. *Hindwing* with greyish-white cell area, elongated broad discal streaks, a submarginal row of two upper irregularly-oval spots and four lower dentate-lunules, and a large quadrate chrome-yellow anal spot; the abdominal margin densely clothed with ochreous-white hairs, the fold when open displaying a lengthened pale ochreous scent-organ. Underside dull ochreous-brown; markings as on the upperside, but less sharply defined. *Thorax*, head, antennæ, and legs black; front of thorax, head, and palpi white spotted; base of thorax laterally clothed with fine grey silky hairs; abdomen dull black, with a broad lateral and sublateral white longitudinal band; fore femora and tibiæ whitish beneath.

Female. Upperside. Ground-colour either dark ochreous-brown or blackish-brown, with the cell and discal streaks on both wings narrower. *Forewing* with the costa and outer area blacker; the inner portions of the cell-streaks obliterated, the rounded spots outside end of the cell also more or less obliterated, the discal streaks much narrower and shorter, the upper two absent, the submarginal spots somewhat smaller. *Hindwing* with the cell and discal streaks narrower, the cell streak and that in the lower median interspace being broadly broken near the end, the submarginal spots all prominent, the anal spot smaller and paler yellow. Underside. *Forewing* dull, or dark ochreous-brown; markings as on the upperside, the lower submarginal spots being somewhat larger. *Hindwing* dull, or brighter, ochreous-brown, with the markings broader than on upperside.

Expanse, ♂ 4 to  $4\frac{1}{2}$  inches, ♀ 4 inches.

HABITAT.—Assam.

VOL. VI. Sept. 13th, 1904.



MIMICRY.—The male is a mimic, probably, of the Limnaine butterfly *Parantica melanoides*, of the Nymphaline genus *Hestina*, and of the Papilionine *Cadugoides Agestor*. The female is, probably, also a mimic of the same sex of the Limnaine *Trepsichrois Linnæi*, and of the mimetic Papilionine, *Chilasa dissimilis*.

DISTRIBUTION.—The type of *P. Xenocles* is recorded to be from Silhet. Col. C. Swinhoe received it from the "Khasia Hills" (Tr. Ent. Soc. 1893, 315). Mr. J. Wood-Mason records "a male taken in May at Durgakuna, Cachar" (J. As. Soc. Beng. 1887, 376). Specimens were taken by Dr. G. Watt "near Manipur" (Ann. N. H. 1885, 384).

Our illustrations on Plate 516, figs. 2, 2a, are from a Khasia specimen of male and female.

**PARANTICOPSIS NERONUS** (Plate 517, fig. 1, 1a, ♂).

*Papilio Xenocles*, f. temp. *Neronus*, Fruhstorfer, Soc. Ent. 1902, p. 74.

*Papilio Xenocles Kephisos*, f. temp. *Neronus*, Fruhstorfer, Berl. Ent. Zeit. 1902, p. 229.

*Papilio Xenocles*, Moore, Proc. Zool. Soc. Lond. 1878, p. 840.

*Papilio (Paranticopsis) Xenocles*, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1887, p. 433.

IMAGO.—Male. Upperside. *Forewing* similar to the typical Assamese *Xenocles*. *Hindwing* with narrower and shorter discal streaks, the lower submarginal spots small and less dentate, or the upper one and the three lower obliterated, the chrome-yellow anal spot somewhat smaller; abdominal margin clothed with ochreous or ochreous-brown hairs. Underside. *Forewing* similar to the upperside. *Hindwing* with similar narrow and short discal streaks and submarginal spots as on the upperside, or the latter obsolescent.

Expanse, ♂ 4 inches.

HABITAT.—Burma; Tenasserim; Shan States; Siam; Upper Tonkin.

DISTRIBUTION.—Col. C. H. E. Adamson records "males not uncommon in Arakan and Tenasserim, at slight elevations, from July till March. The female not seen" (List, 1897, 49). Col. C. T. Bingham obtained it in the Daunat Range, Tenasserim, in September, and in the Thoungyeen Valley in February. Mr. H. Grose-Smith has males from the Ataran Valley, Tenasserim, taken by Mr. T. A. Hauxwell. Mr. H. J. Elwes records "a male from Tavoy, taken in March" (J. A. S. Beng. 1887, 433). We possess a male from Tavoy, taken by Mr. Tucker, and also males from the Upper Mekong, Shan States, taken by Mr. R. Roberts, C.E.

Of our illustrations on Plate 517, fig. 1, is from a Tavoy male, and fig. 1a, from Shan States male.

**PARANTICOPSIS MEGARUS** (Plate 517, fig. 2, ♂, 2a, ♀).

*Papilio Megarus*, Westwood, Arcana Entom. ii. p. 98, pl. 72, fig. 2, ♂ (1845). Doubleday and



Hewitson, Gen. D. Lep. i. p. 20 (1846). Gray, Catal. Lep. Brit. Mus. i. p. 71 (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 90 (1857); *id.* Proc. Zool. Soc. Lond. 1867, p. 672; *id.* *l.c.* 1878, pp. 697, 840. Felder, Verh. Z. B. Ges. Wien. 1864, p. 308. Staudinger, Exot. Schmett. i. p. 6 (1884). Elwes, Trans. Ent. Soc. Lond. 1888, p. 430. Haase, Unters. üb. Mim. p. 37 (1893). Rothschild, Nov. Zool. ii. p. 460 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 230. *Papilio* (*Paranticopsis*) *Megarus*, Elwes and de Nicéville, Journ. As. Soc. Bengal, 1887, p. 433. de Nicéville, Sikkim Gazetteer, 1894, p. 173. *Paranticopsis* *Megarus*, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 315.

IMAGO.—Male. Upperside black with bluish-white markings. *Forewing* with a basal transverse slender macular streak; within the cell are two small basal spots, two medial outwardly-oblique more or less perfect slender waved streaks—the upper one being generally broken, and then two short small oval longitudinally-superposed spots at the apex; beyond are two upper-discal transverse series of small spots, of which the third of the inner row and the two upper of the outer row are sometimes absent, an elongated streak in the lower median interspace, two very slender streaks in the submedian, and then a slender basally obliquely-broken streak along the posterior margin, followed by a submarginal row of rounded spots. *Hindwing* with a slender apically-broken cell-streak, a costal basal spot and a more or less defined elongated slender streak, a subcostal elongated slender broken streak, two lower discal series of four small conical spots in pairs, which are more or less outwardly-indented, the two lower of the inner series each preceded by a short slender streak within the basal interspaces; a slender, elongated streak in the submedian interspace with a small anal spot beyond its end; followed by a submarginal row of curved lunules, the two upper being the broadest; abdominal margin hairy, folded over above, the fold when opened displaying an elongated scent-organ composed of fine silky hairs. Underside pale ochreous-brown. *Forewing* blackish posteriorly; with markings as on upperside, the cell streaks and the inner row of upper-discal spots sometimes being more or less obliterated. *Hindwing* with markings as on upperside, but less prominent; also with two white basal costal spots. *Body* black; front of thorax, collar, and palpi white-spotted; base of thorax clothed with fine silky grey hairs; abdomen with a lateral, sub-lateral, and ventral whitish band; antennæ and legs black.

Female. Similar to the male. Upperside. *Forewing* duller black, the hindwing brownish-black. *Forewing* with the cell markings complete and somewhat broader, the upper discal markings also broader. *Hindwing* with the cell and discal markings slightly narrower than in the male, the submarginal lunules also generally narrower. Underside. Similar to the male. *Forewing* with the cell and discal streaks complete.

Expanse, ♂  $2\frac{3}{4}$  to 3, ♀  $3\frac{1}{4}$  to  $3\frac{1}{2}$  inches.

HABITAT.—Sikkim; Assam; Burma; Shan States; Tenasserim.



DISTRIBUTION.—A male, labelled Sikkim, is in Mr. H. J. Elwes' Collection. A female, also labelled Sikkim, is in Col. C. Swinhoe's Collection. Mr. L. de Nicéville says "its occurrence in Sikkim is more than doubtful" (Sikkim Gaz. 1894, p. 173). It is recorded by Col. Swinhoe from the "Khasia Hills" (Tr. Ent. Soc. 1893, 315). We possess specimens from Silhet. Col. C. H. E. Adamson records it as "a rare species in Burma; three specimens only were taken by me in Tenasserim, in March and April" (List, 1897, 49). Lieut. E. Y. Watson obtained "a few specimens at Beeling, Upper Tenasserim" (J. Bombay N. H. S. 1888, 26). Col. C. T. Bingham took it in the Ataran Valley, Tenasserim, in March, and also in the Thoungyeen Valley. Mr. H. J. Elwes records "many males from Ponsekai and the Hills on the Siamese frontier" (J. As. Soc. Beng. 1887, 433). Mr. W. Rothschild has a female from Martaban, Pegu, taken by Col. Bingham, and also both sexes from Muong Gnow, Shan States.

INDO-MALAYAN SPECIES.—*Paranticopsis Macareus* (Papilio Macareus, Godart, Encyc. Méth. ix. p. 76, ♂ (1819). Horsfield, Catal. Lep. Mus. E. I. Company, pl. 5, fig. 1, ♀ (1828). Lucas, Lép. Exot. p. 45, pl. 23, fig. 1, ♂ (1835). Boisduval, Spec. Gén. Lep. i. p. 374, ♂ ♀ (1836). Moore, Catal. Lep. Mus. E. I. C. i. p. 90 ♂ ♀ (1857). Oberthür, Etud. Ent. iv. p. 100 (1879). Rothschild, Nov. Zool. ii. p. 456, ♂ ♀ (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 226. *Syn. Pap. Striatus*, Zinken-sommer, Nova Acta Akad. Nat. Cur. xv. p. 154, pl. 14, fig. 5, ♂ (1831). Pap. Astina, Westwood, Cabinet of Orient. Ent. p. 20, pl. 9, fig. 3, ♀ (1848), *dimorphic form. Habitat.* Java.—*Paranticopsis Palanus* (Pap. Macareus *aber.* Palanus, Fruhstorfer, Soc. Ent. 1902, p. 74, ♂. *Habitat.* W. Java.—*Paranticopsis Masformis* (Pap. Macareus *aber.* Masformis, Lathy, Entomologist, 1899, p. 149, ♀. Fruhstorfer, Berl. Ent. Zeit. 1902, p. 226. *Habitat.* E. Java.—*Paranticopsis striatus* (Pap. striatus, Lathy, Entom. 1899, p. 149, ♂. Fruhstorfer, *l.c.* p. 227. *Habitat.* Siam.—*Paranticopsis Indochinensis* (Pap. Macareus Indochinensis, Fruhstorfer, Berl. Ent. Zeit. 1902, p. 222, fig. ♂ ♀. *Habitat.* Tonkin.—*Paranticopsis Argentiferus* (Pap. Macareus argentiferus, Fruhstorfer, *l.c.* p. 223, figs. ♂ ♀. *Habitat.* Middle Siam.—*Paranticopsis Perakensis* (Pap. Macareus Perakensis, Fruhstorfer, Soc. Ent. No. 7, xiv.; *id.* Berl. Ent. Zeit. 1902, p. 227. Pap. Macareus (part), Wallace, Trans. Linn. Soc. 1865, p. 62. *Habitat.* Malay Peninsula; Perak; Malacca.—*Paranticopsis Xanthosoma* (Pap. Macareus *var.* Xanthosoma, Staudinger, Iris, ii. p. 7 (1889). Hagen, *ibid.* vii. p. 20 (1894). Rothschild, Nov. Zool. ii. p. 457 (1895). Fruhstorfer, Berl. Ent. Zeit. 1902, p. 227. Pap. (Paranticopsis) Xanthosoma, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 528. *Habitat.* Sumatra.—*Paranticopsis Macaristus* (Pap. Macaristus, Grose-Smith, Ann. and Mag. Nat. Hist. 1887, p. 434. Rothschild, *l.c.* p. 457 (1895). Fruhstorfer, *l.c.* p. 227 (1902). *Syn. Pap. Macareus var.* Borneensis, Staudinger, Iris, ii. p. 7 (1889). *Habitat.* Borneo.—*Paranticopsis*



*Maccabæus* (Pap. *Macareus* var. *Maccabæus*, Staudinger, Iris, ii. p. 6 (1889). Rothschild, *l.c.* p. 458 (1895). Fruhstorfer, *l.c.* 1902, p. 227. *Habitat.* Palawan. *Paranticopsis Stratocles* (Pap. *Stratocles*, Felder, Wien. Ent. Monats. v. p. 298 (1861); *id.* Verh. Z. B. Ges. Wien. 1864, p. 308. Wallace, Trans. Linn. Soc. 1865, p. 63. Staudinger, Iris, ii. p. 7 (1889). Rothschild, *l.c.* ii. p. 461 (1895). Pap. (Chilasa) *Stratocles*, Semper, Philipp. Tagfalt. p. 267, pl. 43, figs. 2, 3, 4, ♂, 5, ♀ (1893). *Syn.* Pap. *Magicus*, Staudinger, Iris, ii. p. 7 (1889). *Habitat.* Philippines.—*Paranticopsis Kephisos* (Pap. *Xenocles*, subsp. *Kephisos*, Fruhstorfer, Deuts. Ent. Zeit. 1901, p. 346; *id.* Berl. Ent. Zeit. 1902, p. 227. *Habitat.* Middle Tonkin.—*Paranticopsis Lindos* (Pap. *Xenocles* subsp. *Lindos*, Fruhstorfer, Deuts. Ent. Zeit. 1901, p. 347; *id.* Berl. Ent. Zeit. 1902, p. 228. *Habitat.* Middle Siam.—*Paranticopsis Xenoclides* (Pap. *Xenocles* subsp. *Xenoclides*, Fruhstorfer, Soc. Ent. 1902, p. 73; *id.* Berl. Ent. Zeit. 1902, p. 229. *Habitat.* Hainan.—*Paranticopsis Delesserti* (Pap. *Delesserti*, Guérin, Rev. Zool. 1839, p. 233; *id.* *l.c.* 1842, p. 153; *id.* Delessert's Souv. Voy. Ind. ii. p. 68, pl. 17, ♀ (1843). Doubleday and Hewitson, Gen. D. Lep. i. p. 20 (1846). Gray, Catal. Lep. B. M. i. p. 71 (1852). Moore, Catal. Lep. Mus. E. I. C. i. p. 91 (1857). Felder, Verh. Z. B. Ges. Wien. 1864, p. 308. Butler, Tr. Linn. Soc. Zool. i. p. 552 (1877). Distant, Rhop. Malay. p. 356, pl. 27 B, fig. 4, ♂ (1885). Hagen, Berl. Ent. Zeit. 1892, p. 155. Rothschild, Nov. Zool. ii. p. 459 (1895). Pap. (Paranticopsis) *Delesserti*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 528. *Syn.* *Papilio Laodocus*, De Haan, Verh. Nat. Gesch. Ned. 1840, p. 42, pl. 8, fig. 5, ♂. Vollenhov. Tijd. v. Ent. 1860, p. 88. Druce, P. Z. S. 1873, p. 356. Staudinger, Exot. Schmett. i. p. 6 (1884). Hagen, Iris, iii. p. 19 (1894). Pap. *Melanides*, Erichson, Wieg. Archiv. fur Nat. ii. p. 248 (1843). Pap. *De Haanii*, Wallace, Tr. Linn. Soc. Lond. 1865, p. 62. Pap. *Laodocus* var. *Palawanicus*, Staudinger, Iris ii. p. 6 (1889). Pap. *Catoris*, Grose-Smith, Ann. Nat. Hist. 1892, p. 426. Pap. *Deless.* subsp. *hyalinus*, Fruhstorfer, Soc. Ent. 1901, p. 90. *Habitat.* Malay Peninsula; Nias; Sumatra; Java; Natuna; Borneo; Palawan.—*Paranticopsis Leucothoë* (Pap. *Leucothoë*, Westwood, Arc. Ent. ii. p. 128, pl. 79, fig. 3, ♂ (1845). Felder, Verh. Z. B. Ges. Wien. 1864, p. 308. Wallace, Tr. Linn. Soc. 1865, p. 62. Oberthür, Etud. Ent. iv. p. 100 (1879). Staudinger, Exot. Schmett. i. p. 6 (1884). Distant, Rhop. Malay, p. 356, pl. 27a, fig. 2, ♂, 3, ♀ (1885). Rothschild, Nov. Zool. ii. p. 458 (1895). *Habitat.* Malay Peninsula.—*Paranticopsis interjectus* (Pap. *Lencothoë* var. *interjectus*, Honrath, Berl. Ent. Zeit. 1893, p. 490. Hagen, Iris, viii. p. 20 (1894). Rothschild, *l.c.* p. 459 (1895). Pap. (Paranticopsis) *Lencothoë*, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 528. *Habitat.* Sumatra. *Paranticopsis Ramaceus* (Pap. *Ramaceus*, Westwood, Trans. Ent. Soc. Lond. 1872, p. 95, pl. 5, fig. 3, ♂. Druce, Proc. Zool. Soc. Lond. 1873, p. 356. Pap. *Leucothoë* subsp. *Ramaceus*, Rothschild, *l.c.*



p. 459 (1895). *Syn.* Pap. Schonbergianus, Honrath, Berl. Ent. Zeit. 1888, p. 250, pl. 5, fig. 4, ♂. *Habitat.* Borneo.—*Paranticopsis similis* (Pap. similis, Lathy, Entomologist, 1899, p. 149, ♂). Pap. Megarus similis, Fruhstorfer, Berl. Ent. Zeit. 1902, p. 230. Pap. Megarus, Distant, Rhop. Malay. p. 468, pl. 42, fig. 9. *Habitat.* Malay Peninsula.—*Paranticopsis Martinus* (Pap. Megarus subsp. Martinus, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 134; *id.* Berl. Ent. Zeit. 1902, p. 230. Pap. (Paranticopsis) Megarus, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 529. *Habitat.* Sumatra.—*Paranticopsis Mendicus* (Pap. Megarus subsp. Mendicus, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 134; *id.* Berl. Ent. Zeit. 1902, p. 230. *Habitat.* Siam.—*Paranticopsis Megapenthes* (Pap. Megarus subsp. Megapenthes, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 133; *id.* Berl. Ent. Zeit. 1902, p. 230. Pap. Megarus, Moore, P. Z. S. 1878, p. 697. Holland, Trans. Amer. Ent. Soc. 1887, p. 122. Oberthür, Etud. Ent. xvii. p. 5 (1893). *Habitat.* S. Annam; Tonkin; Hainan.—*Paranticopsis Sagittiger* (Pap. Megarus subsp. Sagittiger, Fruhstorfer, D. E. Z. 1902, p. 134; *id.* B. E. Z. 1902, p. 230. *Habitat.* N. Borneo.—*Paranticopsis fleximacula* (Pap. Megarus subsp. fleximacula, Rothschild, Nov. Zool. ii. p. 460, ♂ ♀. *Habitat.* Banguay Island.—*Paranticopsis Megæra* (Pap. Megæra, Staudinger, Iris, 1888, p. 275; *id.* l.c. 1889, p. 8. Rothschild, Nov. Zool. ii. p. 461 (1895). *Habitat.* Palawan.

### Family PIERIDÆ.

- Papilio Danai Candidi*, Linnæus, Syst. Nat. x. ed. p. 467 (1758); *id.* xii. ed. p. 758 (1767). Sulzer, Gesch. der Ins. p. 143 (1776). Esper, Die Schmett. p. 51 (1777). Barbut, Gen. Ins. Linn. p. 170 (1781). Esper, Nat. des Linn. Syst. p. 209 (1784). Cuvier, Tabl. Elem. Hist. Nat. p. 590 (1798). Latreille, Hist. Nat. Gen. C. et Ins. iii. p. 396 (1802). Haworth, Lep. Brit. p. 7 (1803). Ochseneimer, Schmett. Eur. ii. p. 141 (1808).
- Pap. Danai Candidi* (pt.), Poda, Ins. Mus. Græc. p. 61 (1761). Scopoli, Ent. Carn. p. 166 (1763). Linn. Mus. Ulr. p. 236 (1764). Fabricius, Syst. Ent. p. 468 (1775).
- Papilio Danai* (pt.), Müller, Faun. Ins. Frid. p. 32 (1764); Barbut, Gen. Ins. Linn. p. 162 (1781). Lamarck, Syst. Nat. Anim. p. 284 (1801).
- Danai*, Fabricius, Ent. Syst. iii. i. p. 186 (1793). Weber, Nomen. Ent. pp. 99, 106 (1795). Scudder, Syst. Rev. Amer. Butt. p. 37 (1872).
- Papilio Danai Flavi*, Ochseneimer, Schmett. Eur. ii. p. 172 (1808).
- Pap. Heliconii* (pt.), Linn. Syst. Nat. x. ed. p. 465 (1758); *id.* xii. ed. p. 744 (1767); *id.* Faun. Suec. p. 268 (1761).
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- Papilionida* (pt.), Leech, Edin. Encycl. ix. p. 127 (1815).
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- Stephens, Ill. Brit. Lep. Haust. i. p. 5 (1827); *id.* Catal. Brit. Lep. Brit. Mus. p. i. (1850).  
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*Pierides*, Boisduval, Spéc. Gen. Lep. i. pp. 163, 402 (1836); *id.* Index Méth. Eur. Lep. p. 4 (1840).  
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*Pieridæ*, Duponchel, Catal. Lep. Fr. p. 21 (1840); *id.* Cat. Lep. Eur. p. 23 (1844). Doubleday and Hewitson, Gen. D. Lep. i. p. 32 (1847). Lang, Eur. Butt. i. p. 26 (1884). Doherty, Journ. As. Soc. Bengal, 1886, p. 110. Kirby, Allen's Nat. Libr. Butt. ii. p. 137 (1896). Tutt, Brit. Butt. pp. 86, 223 (1896). Jordan, Nov. Zool. v. p. 381 (1896). Grote, Trans. Ent. Soc. Lond. 1897, p. 340. Young, Journ. Bombay N. H. Soc. 1903, p. 306.  
*Pierinæ*, Swainson, Cab. Cycl. p. 87 (1840). Bates, Journ. Ent. ii. p. 177 (1864). Butler, Catal. Fabr. Lep. B. M. p. 199 (1869). Kirby, Syn. Catal. D. Lep. p. 428 (1871). Moore, Lep. Ceylon, i. p. 116 (1881). Marshall and de Nicéville, Butt. Ind. etc. i. p. 18 (1882). Distant, Rhop. Malay. p. 283 (1885). Scudder, Butt. U.S. ii. p. 1033 (1889).  
*Heliconides*, Wallengren, Lep. Scand. pp. 5, 130 (1853).  
*Pieridi*, Stainton, Man. B. Lep. i. pp. 12, 15 (1856).  
*Pieridina*, Herr. Schæffer, Lep. Exot. p. 54 (1858); *id.* Prod. Syst. Lep. p. 7 (1864). Plotz, Mitth. Nat. Ver. N. V. Rügen, xvii. p. 7 (1886).  
*Dismorphiadæ* et *Pierididæ*, Grote, Proc. Amer. Phil. Soc. xxxix. pp. 13, 18 (1900).

## CHARACTERS OF THE PIERIDÆ.

IMAGO.—Wings of moderate or of small size; discoidal cells always closed. *Forewing* subtriangular, rarely triangular, apex either rounded or obtusely or pointedly-angled, occasionally subfalcate and the outer margin slightly dentated; subcostal vein either *three, four, or five* branched; the first, and usually also the second branch, is emitted before the end of the cell; the second being either single or rarely bifid, or the third is bifid or trifid; the upper radial veinlet is most frequently emitted beyond the end of the cell—and, when so positioned, appears as an additional subcostal branch, the lower radial only then being emitted from the discocellulars; in some genera five subcostal branches arise consecutively beyond the end of the cell, and the two radials are both emitted from the discocellulars; median vein three branched; submedian vein free. *Hindwing* broadly rounded externally, never tailed; outer margin rarely slightly dentated and with a more prominent angulation at the end of the upper median veinlet; abdominal margin channelled for the reception of the abdomen; precostal vein free and emitted at some distance from the base of the costal vein; no interno-basal costal cell; a submedian and an internal vein present. *Body* moderately slender; abdomen of male with moderately large anal valves; palpi rather long, basal joints hairy; antennæ long, club more or less lengthened, or short, thickened gradually to the



apex, which is truncate; legs all perfect, long, tarsal claws bifid, and mostly with pulvilli and paronychia; front tibiæ without a lateral spur.

EGG.—“Very tall and slender, tapering toward a much smaller rounded summit, either squarely truncate at the base, or tapering as much or nearly as much as at the summit, so as to render the egg subfusiform; provided with a number of distinct longitudinal ribs and crossed by frequent transverse finer raised lines” (Scudder, *l.c.* 1033).

ADULT LARVA.—Cylindrical; very slightly tapering at the ends; body smooth or uniformly clothed with short fine pubescence arising from minute warts, or the hairs are longish and sparsely distributed; head free; prothoracic segment not furnished with retractile tentacula.

PUPA.—Attached by the tail and a girth round the body; slender, angulated; head more or less pointed.

HABITS OF LARVÆ, ETC.—“All the larvæ of the Pieridæ lie, when full grown, on the upperside of the leaf, and, when solitary (some of them are gregarious) along the mid-rib, coating the leaf where they lie with a bed of silk. The eggs are generally laid singly on the upper surface of the leaf or on young shoots; exceptions to this are *Teracolus amatus*, *Appias Hippoides*, and *Delias Eucharis*,—this last is aberrant also in that the eggs are laid on the underside of the leaf, where the larvæ herd together,—*Belenois Mesentina*, *Terias Silhetana*, which lay their eggs in clusters, the larvæ of these, when young, are gregarious, but generally, when full grown, separate where the food is plentiful. The egg of the Pieridæ is spindle-shaped, standing on one end, and is always more or less strongly ridged longitudinally and striated finely transversely; in colour it is generally pure white, turning to yellow or orange, that of *Nychitona Xiphia* is blue, and that of *Huphina* blotched with red. With few exceptions, the Pieridæ are very much alike in the larva state, more alike than the different species of one genus often are among the Nymphalidæ. The head is large, the body long and somewhat depressed, without excrescences, but rough owing to the presence of minute tubercles discernible generally only with the aid of a lens; the colour is green, with usually a lateral stripe” (Davidson, Bell, and Aitken, *Journ. Bombay N. H. Soc.* 1896, 569).

CANNIBALISM.—“The larvæ of *Appias* will eat each other and any other species of larva feeding on the same food-plant as themselves, if forced to it by hunger. I have seen the larvæ of *Appias Libythea* and *A. Taprobana* eat freshly-formed pupæ of their own species, as well as larvæ changing their skins, and also the larvæ and pupæ of *Leptosia Xiphia*” (J. R. D. Bell, *Journ. As. Soc. Bengal*, 1900, 189).

FOOD PLANTS.—The larvæ of the Pieridæ feed on plants of the Nat. Orders *Leguminosæ*, *Loranthaceæ*, and *Capparidaceæ*.

SWARMING AND MIGRATORY HABITS OF IMAGO.—A pseudonymous author, “Eha,”



in "The Tribes on my Frontier," p. 113, quoted by Mr. Distant (Rhop. Malay. p. 285), observes that "butterflies of some kinds—especially those energetic greenish-white ones of the family surnamed *Callidryas*—are sometimes seized with a mania for migrating to the far West. I have stood near one of the parade-grounds at Poona, and watched them, with scarce a pause to rest their wings or sip a flower, from eight or nine o'clock until the afternoon, as far as the eye could reach, the host kept streaming past."

"It was probably butterflies principally belonging to the Pieridæ," writes Mr. W. L. Distant (Rhop. Malayana, p. 284), "which were observed by Mr. E. L. Arnold in Southern India, on one of his excursions in the dry-season." He relates that he "came upon a quiet nullah meandering through the jungle. The bed by chance, just there, was broad and sandy, and the stream a single thread that seemed every moment in danger of vanishing. But to my astonished eyes the whole place appeared a garden of flowers of a thousand colours, and crowded so close by the water that the sand could scarcely be seen. I looked and looked again, and then stepped down to observe the parterre closer; but, as I did so, these animated blossoms sprang into the air in a huge cloud, and the truth was plain that they were a countless host of thirsty butterflies, collected from the forest all round to drink at this thread of liquid" (On the Indian Hills, ii. 314 (1881). Mr. G. F. Hampson writes, "the only regular flight of butterflies that I have observed in the Nilgiri District, S. India, is one that takes place at the end of May and beginning of June, and consists principally of *Catopsilias* and *Catophagas* (with some *Limnainæ* and *Euplœinæ*). Its direction is from West to East, and the object may be to avoid the S.-W. Monsoon due on June 15th, and sure to deluge the Western and Northern Slopes for many weeks together, with hardly a break" (Epist. Sept. 14th, 1886). Sir J. E. Tennent, in his Nat. History of Ceylon, p. 403, says, "at times the extraordinary sight presented itself of flights of these delicate creatures, generally of a white or pale yellow hue, apparently miles in breadth and of such prodigious extension as to occupy hours, and even days, uninterruptedly in their passage—whence coming no one knows, whither going no one can tell. The butterflies I have seen in these wonderful migrations in Ceylon were mostly *Callidryas Hilaria*, *C. Alcmeone*, and *C. Pyranthe*, with straggling individuals of the genus *Euplœa* (*E. Core* and *E. Prothoe*). Their passage took place in April and May, generally in a north-easterly direction. A friend of mine travelling from Kandy to Kornegalle drove for nine miles through a cloud of white butterflies which were passing across the road by which he went." Dr. Thwaites, in his Ceylon MS. Notes, writes, "This family of butterflies contains several species which are remarkable, like some of the *Euplœinæ*, for their apparently migratory flights. At certain times of the year immense hosts of these butterflies, mostly of a white colour or nearly



white, may be observed during the hottest part of the day rushing in an impetuous flight across the country, drawn by some irresistible instinctive impulse, and impatient of any obstruction in their headlong course; even ascending hills of 6,000 feet elevation, and descending again; striking like animated snow-flakes against any one meeting them in their course; and then, after passing the obstruction, making on with the same pertinacity as before towards where they are hurrying to, until the failure of sunshine arrests their progress for the day, to be continued probably on succeeding days until the wondrous furor has exhausted itself. By the superstitious natives these marvellous movements of white butterflies are attributed to a desire on the part of the insects to do homage to the footstep of Buddha on Adams Peak, moved, as the native himself is, to do so at certain times of the year. But the phenomenon itself, apart from the native idea, is well worthy of study by any one who has time and opportunities to devote to it. It would be interesting to ascertain, firstly, whence these butterfly hosts come and where their feeding grounds when in the larval state; secondly, to determine if the immense numbers of these butterflies, which have halted for the night, wake up in the early morning to continue their course in exactly the same direction as on the previous day, and at what hour the resumed movement commences; and thirdly, to ascertain if, during the time their progress is arrested by night, many fall a prey to the attacks of birds, bats, lizards, etc., to an extent to reduce their numbers very considerably, and how their eventual disappearance is to be accounted for. I should remark that amongst the main body of these travelling white butterflies, small groups of half a dozen individuals or more may be observed, which in strings of sequence, looking as if playing 'follow my leader,' have a very pretty appearance. In some portions of the country in their line of flight, where shallow water may be lying, large numbers of these white butterflies may be seen quenching their thirst on the damp ground, and flying up when disturbed in quite a startling cloud." Mr. T. J. Mann writes (Proc. Linn. Soc. Lond. June, 1895), "I observed *Catophaga Galene*, in Ceylon, migrating in thousands across the northern part of the Island during March and April, 1859, in a direction from N.E. to S.W. The movement commenced about 7 a.m., and lasted until noon, when it decreased, and was renewed in the afternoon for another two hours." Dr. N. Manders, in Mr. de Nicéville's List of Ceylon butterflies (Journ. As. Soc. Bengal, 1899, 172), remarks, "After the initial heavy rains, butterflies start afresh in November, December, and January, and it is in these months more especially, though to a slighter extent at the beginning of the S.W. Monsoon in June, that the extraordinary migratory flights of butterflies take place. These flights are perfectly amazing and scarcely credible. At Colombo, where Dr. Manders has more particularly noticed them, the direction of the flight is always northerly and principally along the sea shore, possibly the more readily to



avoid obstacles. The species which comprise these sensational flights are the following, to the exclusion of almost any other:—*Euploea Asela* (and *E. Montana* in May), *Appias albina*, *A. Paulina*, and the two *Catopsilias*, *Papilio Demoleus*, and *Belenois Mesentina* [*Taprobana*], irregularly. He calculated the number passing two fixed points 20 yards apart close to the edge of the sea, and concluded that not less than 14,000 passed between these points during the hours the flight lasted, from 10 a.m. to 2 or 3 p.m.” Another observer, Col. C. J. Bingham, says, “I had been in the Salween forests, beyond the great rapids, and was returning to Moulmein. It was a steamy day in October, and I was lying with the hot fever fit on me in the boat on the Salween below Shwegon, when I noticed clouds of butterflies, chiefly *Catopsilia*, migrating, crossing the Salween from East to West in a continuous stream” (Tr. Ent. Soc. Lond. 1902, 363).

MIMICRY.—Mimicry in this family of butterflies, within our area, occurs in the genus *Metaporia*,—*M. Caphusa*, *Ariaca*, and *Agathon*, each being fair mimics of the common Limnaine butterfly *Parantica melanoides*. The females of the various species of *Nepheronia*, also mimic species of the Limnaine genera *Bahora*, *Parantica*, *Caduga*, and *Badacara*. In *Hebomoia Glaucippe*, and allied species, when at rest with the wings vertically closed, the resemblance to a dead leaf is very striking. Mimicry also occurs between certain genera within the Family, an example of which is the Ceylonese *Prioneris Sita*, this rare species being, in both sexes, a splendid mimic of the common and highly-protected *Piccarda Eucharis*.

SEASONAL BROODS.—In his “Notes on Indian Pierinæ,” Capt. E. Y. Watson (Journ. Bombay Nat. Hist. Soc. 1894, p. 489) writes, “In different parts of the Indian region the seasons vary to a certain extent, so that it cannot be laid down as a fixed rule that specimens captured in any particular month will belong to any particular form; besides which allowance has to be made for breaks in the rains or showers in the dry-season. Roughly, however, the *rainy-season* may be said to extend from the middle of May to the middle of November, and the *dry-season* for the rest of the year, and it will be found that the very large majority of the specimens obtained during these periods will be wet- and dry-season forms respectively. The limitations given above are approximately those of the seasons in Burma, but they are liable to vary a fortnight either way, while in the hilly districts of that country the rains sometimes continue till well in December. The same limitations would also apply fairly well to the whole of Eastern and Southern India, but in the dry tracts of the North-west the rains are of shorter duration and are less continuous; consequently rainy-season forms are scarce, and dry-season ones are much more pronounced.

“It must also be borne in mind that these seasonal races are not confined to two clearly-defined forms, *i.e.* a rainy-season and a dry-season form, but that in



most species there are not only two very distinct-looking forms which represent the extremes of the two seasonal races, and which prevail in the rainy and dry-seasons respectively, but also numerous intermediates linking these extremes together, many of these intermediates having received names. A further point to be noticed is that these forms themselves vary according to the vegetation and rainfall, so that the extreme of the rainy-season form from a district where the rainfall is great and the vegetation dense, is much more pronounced than the extreme of the rainy-season form from a district with slight rainfall and sparse vegetation; and these differences are even more marked in the dry-season forms; while in all genera the dry-season forms are, as a rule, smaller than the rainy-season forms."

### Sub-family PIERINÆ.

- Pieridi* (pt.), Stephens, Catal. Brit. Lep. B. M. p. 3 (1850). Stainton, Manual Brit. Lep. i. p. 15 (1857).  
*Pierinæ* (Div. 1; et 2 pt.), Butler, Cistula Ent. i. p. 55 (1870).  
*Pieridæ*, Schatz, Exot. Schmett. ii. p. 58 (1886).  
*Pieridi*, Scudder, Butt. U.S. ii. p. 1154 (1889).  
*Pierinæ*, Kirby, Allen's Nat. Libr. Butt. ii. p. 139 (1896).  
*Pierinæ* (Tribe *Aporidi* et *Pieridi*) Tutt, Brit. Butt. pp. 86, 225-9 (1896).  
*Pierinæ* (pt.), Jordan, Nov. Zool. v. p. 381 (1898).  
*Pieridini* (pt.), Grote, Proc. Amer. Phil. Soc. 1900, p. 20.  
*Voracia*, Hübner, Verz. bek. Schmett. p. 90 (1816).

### CHARACTERS OF THE PIERINÆ.

IMAGO.—*Forewing* with the subcostal vein either *three* or *four* branched; the first branch and usually also the second is emitted before the end of the cell; the second being either single or rarely bifid, and the third most generally bifid; the upper radial veinlet most generally emitted beyond the end of the cell, and the lower radial only starting from the discocellulars; in *Baltia* both radials start from the subcostal beyond the cell.

### Genus DANAUS.

- Danaus* (*Danai Candidi*), Linnæus, Syst. Nat. x. ed. pp. 467-470 (1758); *id.* xii. ed. i. 2, pp. 758-765 (1767).  
*Danaus*, Esper, Die Schmett. i. p. 51 (1777). Cederheim, Faun. Ingricæ Prod. p. 206 (1798).  
 Panzer, Faun. Ins. Germ. Hefte, 84, Index, p. xi. (1801). Oken, Lehrb. i. p. 723 (1815).  
 Crotch, Cistula Entom. i. p. 60 (1870).  
*Pieris* (sect. 3 pt.), Schrank, Fauna Boica, iii. i. p. 160 (1801).  
*Pieris* (pt.), Latreille, Sonn. Buff. xiv. p. 111 (1805); *id.* Gen. Cr. et Ins. iv. p. 203 (1809). Lamarck, Hist. Nat. Anim. iv. p. 30 (1816). Boisduval, Spéc. Gen. Lep. i. p. 437 (1836). Doubleday



- and Hewitson, Gen. D. Lep. i. p. 42 (1847). Stainton, Man. Brit. Lep. i. p. 18 (1857). Kirby, Eur. Butt. p. 8 (1863).
- Mancipium*, Hübner, Tentamen, p. 1 (1806). Scudder, Proc. Amer. Acad. A. and Sci. 1875, p. 210. Grote, Proc. Amer. Phil. Soc. xxxix. p. 21 (1900).
- Pontia* (pt.), Fabricius, Illiger's Mag. vi. p. 283 (1867). Leach, Edinb. Encyc. p. 716 (1815). Ochseneimer, Schmett. Eur. iv. p. 30 (1816). Samouelle, Ent. U. Comp. p. 236 (1819). Jermyn, Butt. Coll. Vade Mec. pp. 43, 66. (1824).
- Pieris*, Latreille, Consid. Gen. C. et Ins. p. 440 (1810). Staudinger and Schatz, Exot. Schmett. ii. p. 60 (1886). Scudder, Syst. Rev. Amer. Butt. p. 41 (1872); *id.* Butt. U.S. ii. p. 1171 (1889). Kirby, Allen's Natr. Libr. Butt. ii. p. 142 (1896). Tutt, Brit. Butt. p. 229 (1896). Grote, Proc. Amer. Phil. Soc. xxxix. p. 21 (1900).
- Ganoris* (pt.), Dalman, Vetensk. Acad. Handl. xxxvii. pp. 61, 86 (1816).
- Catophaga* (pt.), Hübner, Verz. bek. Schmett. p. 93 (1816).
- Pontia* (sect. 1), Stephens, Illust. Brit. Ent. Haust. i. p. 15 (1827).
- Pontia*, Rennie, Consp. Butt. p. 2 (1832). Westwood, Intr. Class. Ins. ii. Syn. p. 87 (1840).
- Pieris* (sect. A), Stephens, Catal. Brit. Lep. B. M. p. 4. (1850).

IMAGO.—*Forewing* elongated, triangular; apex obtusely angled; cilia ample; subcostal vein four branched, first and second free; first at one-fourth before end of the cell, second immediately before the end, third bifid, the fourth starting from close to the apex; upper radial emitted from the subcostal at nearly one-third beyond the cell, lower radial from angle of the discocellulars; cell long and broad; median veinlets equidistant apart; submedian vein recurved. *Hindwing* elongated anteriorly; costa very oblique, convex externally; cilia ample; cell long, broad across the middle and pointed at the apex; discocellulars long and very oblique, nearly straight; subcostal branches very long; submedians long. *Thorax*, head and front clothed with fine silky hairs; palpi short, hairy beneath to the tip, terminal joint cylindrical and longer than second; antennæ long, slender, club gradually thickened to tip, club almost cylindrical; abdomen of male above densely clothed with laxly compressed longish hair-like scales, denser beneath.

EGG.—Flask or skittle-shaped, with 15 to 17 longitudinal ribs, and delicate transverse reticulation. Deposited on end in batches.

LARVA.—Cylindrical; clothed with very short fine hairs. Often gregarious, but not living under a web. Feeds on *Cruciferae* and *Tropæolaceæ*.

PUPA.—Attached by the tail and a girth round the body. "Stout, somewhat angulated; head with a central projected spike; back keeled throughout, the keel rising angularly on thorax to an obtuse posterior point and then descending to the waist; abdomen not so prominently keeled, at the end the keel bifurcates forming the two sides of the anal spike; the shoulders angulated, from these a subdorsal ridge angulated along the wing-cases with two prominences, the second is highest, and in some becomes quite a spike; outline of belly gently curved from head to end of wing-cases, where the tongue-case projects free, thence the abdomen is less curved



to the tail; the anal spike flat, almost square, being made up of the two outside ridges with a triangular piece between and set on the ventral surface with many short spines curved at the tip and then spreading into broad edged hooks." (Buckler.)

TYPE.—*D. Brassicæ*.

#### HISTORICAL NOTE ON THE GENUS *DANAUS*.

1758. Linnæus, Syst. Nat. ed. x. pp. 467-470, used the name *DANAUS* only, at the heading of the pages, for both the sections of his *Papilio Danai*, viz. *Danai Candidi* and *D. Festivi*. The species enumerated under the first section being modern *Pieridæ*, and those of the second section mostly *Euplœinæ*.
1761. Poda, Ins. Mus. Græcensis, p. 61, cites species of *Pieridæ* only, under *D. Candidi*.
1777. Esper, Die Schmett. i. p. 51, uses the name *Danaus*, in a subgeneric sense, for species of *Pieridæ*, representing the Linnæan *D. Candidi*, and figures *D. Brassicæ*.
1788. Borkhausen, Nat. Eur. Schmett. i. p. 252, establishes the *Danai* on modern *Pieridæ*, *Rhamni*, *Cleopatra*, *Hyale*, *Cardamines*, *Daplidice*, *Sinapis*, *Napi*, *Brassicæ*, *Cratægi*, etc.
1793. Fabricius, Ent. Syst. iii. p. 186, restricts the *Danai* to the *D. Candidi* of Linnæus, and separates the modern *Danainæ* [*Euplœinæ*] under the name of *Festivi*.
1795. Weber, Nomen. Ent. pp. 99, 106, follows the restriction of Fabricius.
1798. Cuvier, Tabl. Elem. Hist. Nat. p. 590, cites species of *Pieridæ* only (*Brassicæ*, *Rapæ*) under *Danai*.
1798. Cederheim, Faun. Ingricæ Prod. p. 206, uses *Danaus* for species of *Pieridæ* (*Brassicæ*, *Rapæ*, *Napi*, *Sinapis*, *Daplidice*, *Cardamines*, *Rhamni*).
1801. Lamarck, Syst. Anim. p. 284, under *P. Danai*, gives *Brassicæ* and *Argus*.
1801. Panzer, Faun. Ins. Germ. Hefte, 73, 74; id. 84, Index p. xi. uses *Danaus* generically, for species of *Pieridæ*.
1806. Turton, Linn. Syst. Nat. iii. pt. 2, p. 64, also restricts the *Danai* to species of *Pieridæ*.
1809. Latreille, Gen. C. et Ins. iv. p. 201, proposed *Danaus* to supplant his own genus *Danaida* (Sonn. Buff. xiv. 108 (1805), and of *Danais* (Illiger's Mag. vi. p. 291 (1807)), using it for species of *Euplœinæ*.
1815. Oken, Lehrb. i. p. 723, used *Danaus* for *Pieridæ* only.
1872. Crotch, Cistula Entom. i. p. 60, refers *Danaus* to Linnæus, and says the type was fixed by Cuvier (Tabl. Elem. 1798, p. 590) as *Brassicæ*.



From the above details of the restriction of the Linnæan *Danai* to the *D. Candidi*, it is evident that the action of these earlier authors must take precedence of that of Latreille. (*Conf.* Kirby, Journ. Linn. Soc. Zool. x. pp. 397-8 (1870); *id.* Allen's Nat. Libr. Butt. i. p. 18 (1894); *id. l.c.* ii. p. 142 (1896). Moore, Lep. Ceylon, i. p. 1 (1881); *id.* Lep. Indica, i. p. 8 (1890).

**DANAUS BRASSICÆ** (Plate 518, fig. 1 ♂, 1a ♀).

- Pap. Danaus Brassicæ*, Linnæus, Syst. Nat. x. ed. p. 467 (1758). Müller, Faun. Ins. Frid. p. 32 (1764). Linn. Syst. Nat. xii. ed. p. 758 (1767). Esper, Die Schmett. i. p. 52, pl. 3, fig. 1 (1777).
- Pieris Brassicæ*, Schrank, Fauna Boica, ii. i. p. 165 (1801). Kollar, Hügel's Kaschmir, iv. 2, p. 409 (1844). Elwes, P. Z. S. 1882, p. 401; *id.* Trans. Ent. Soc. 1888, p. 416. Mackinnon, Journ. Bombay, Nat. Hist. Soc. 1898, p. 590.
- Pieris Brassicæ* var. *Nepalensis*, Gray, Lep. Ins. of Nepal, p. 9, pl. 6, figs. 1, 3 ♂ ♀ (1846). Lang, Ent. Mo. Mag. 1864, p. 103. Moore, P. Z. S. 1865, p. 490; *id.* 1874, p. 273.
- Mancipium Nipalensis*, Moore, Proc. Zool. Soc. 1882, p. 256.
- Danaus Brassicæ*, Crotch, Cist. Ent. i. p. 60 (1870).
- Ganoris Nipalensis*, Swinhoe, Trans. Ent. Soc. 1885, p. 343. Butler, P. Z. S. 1886, p. 376; *id.* Ann. Nat. Hist. 1888, p. 204.
- Mancipium Brassicæ*, de Nicéville, Sikkim Gaz. 1894, p. 168.

IMAGO.—Male. Upperside white. *Forewing* with the base and costa slightly greyish-black scaled; the apex with a broad black posteriorly-decreasing band extending to below the middle median veinlet, its inner margin being excurved and slightly irregular; occasionally a very few black scales are present in the upper median interspace. *Hindwing* with a black costal spot. Underside. *Forewing* white, the apical band very pale yellow; a large quadrate black discal spot between the upper and middle medians, and a more irregular shaped spot between the lower median and submedian. *Hindwing* very pale yellow, sparsely speckled with minute black scales, these scales being slightly more numerous in the cell area; extreme basal edge of costa slightly brighter yellow; costal black spot less prominent than on upperside.

Female. Upperside white. *Forewing* with the black apical band somewhat broader; a discal large black quadrate spot between the upper and middle median veinlets, a similar spot between the lower median and submedian, and a more or less elongated streak below the latter vein. *Hindwing* with a black costal spot which is generally larger than in the male. Underside similar to the male. *Body* above greyish-black; thorax clothed with grey hairs; body beneath white; front of head, palpi, and legs white; antennæ black above, segmented beneath with white, the tip white.



Expanse, ♂  $2\frac{1}{2}$  to  $2\frac{3}{4}$ , ♀  $2\frac{3}{4}$  inches.

HABITAT.—Europe; N. and C. Asia; Afghanistan; W. and E. Himalayas.

DISTRIBUTION (Within our Area).—Specimens from Chitral, taken by Capt. G. H. Colomb, from Gilgit, by Capt. Biddulph, and from Ladak, by Capt. F. E. S. Adair, are in the British Museum Collection. We possess a male from Ladak, taken by the Messrs. Schlagtweit, both sexes from Kashmir, taken by Capt. R. Bayne Reed, and others from Simla, Masuri, and Kumaon. Capt. H. B. Hellard obtained it at "Pangi, in Busahur, in July and August, in the Indus Valley between Dras River and Skardo in July, and also in Kashmir from July to September" (MS. Notes). In Mr. J. H. Leech's Collection are specimens taken by himself at Dras in June, others from Kujiar, 6,000 feet elevation, and Narkunda in April, Kardong, 14,000 feet, in August, Chonging Valley, 15-17,000 feet, in July and August, and at Kylang, 13,000 feet, in September, all taken by Capt. H. McArthur. Col. J. W. Yerbury found it "common at Campbellpur from May to July, and from October to December. The Cabbages in my garden are covered at the present time, January 11th, with the caterpillars of some white butterfly, and there are some half-dozen chrysalides on the walls of the bungalow, all probably belonging to this species" (Proc. Zool. Soc. 1886, 376). Also taken at "Thundiani, in September" (*id.* Ann. N. H. 1888, 204). Col. C. Swinhoe records "a single male taken at Kasian, Afghanistan, in June" (Tr. Ent. Soc. 1885, 343). Mr. P. W. Mackinnon found it "very common in Masuri and less so in the Dun, in March, but not found in any great numbers later in the year, although an occasional specimen may be seen in almost every month in gardens in Masuri in the spring, the larva does great damage to cabbages (*Brassica campestris*, N. O. Cruciferae), so much so that boys have to be continually employed in picking them off" (Journ. Bombay N. H. Soc. 1898, 590). Capt. A. M. Lang records it being found "everywhere in the N.W. Himalayas up to 10,000 feet altitude" (P. Z. S. 1865, 90). Capt. Lang also records it as "abundant at Umballa, in the Plains, in January, but I never saw it in Oudh" (Ent. Mo. Mag. 1864, 103). "Common in Dharmasala; larvæ reared on May 5th from eggs found on the *Nasturtium*. Imagines came out on May 25th. Two or three broods in the year" (J. H. Hocking, P. Z. S. 1882, 256). Mr. L. de Nicéville records it from "Singal, Gilgit River Valley, at 7,100 feet elevation" (Rept. Pamur Comm. 43). Mr. G. R. Gray's type was obtained in Nepal by Gen. T. Hardwicke (List. Lep. B. M. i. 32 (1844). Mr. H. J. Elwes says "it is commoner in the interior of Sikkim than at Darjiling, but occurs there from March to December, and as low as 3,000 feet" (Tr. Ent. Soc. 1888, 416). Mr. Elwes has also received specimens, taken by native collector, probably in the Chumbi Valley. Col. C. T. Bingham has received it from "Yatung, Tibet, taken in June." Mr. Dudgeon obtained it in Bhotan.



**DANAUS DEOTA** (Plate 518, fig. 2, 2a, ♂).

*Mancipium Deota*, de Nicéville, Journ. Asiatic Soc. Bengal, 1883-4, p. 82, pl. 9, fig. 10, ♂; *id.* Report, Pamir Comm. pp. 16, 43 (1898).

*Pieris Roborowskii*, Alpheraky, Rom. Mem. v. p. 69, pl. 4, fig. 3, a, b, ♂ ♀ (1889).

IMAGO.—Male. Upperside white. *Forewing* with a black apical marginal band, which is somewhat narrower than in *Brassicæ*, and extends posteriorly beyond the lower median veinlet, its lower inner-edge being deeply sinuous between the veins; a distinct but slight black-scaled small discal streak is also generally present between the upper and middle median veinlets. *Hindwing* with a black costal spot, and a continuous narrow macular outer marginal band. Underside. *Forewing* white, with the outer band paler and apically powdered with brown scales; a black medial-discal spot which slightly extends below the middle median veinlet, a similar smaller spot between the lower median and submedian vein, and an upper costal spot extending to below the lower subcostal veinlet. *Hindwing* greyish-brown, irrorated with black scales, clusters of these black scales also forming an ill-defined costal spot and marginal macular band, as disposed on the upperside, and also a small discal spot between the upper and middle median veinlets.

Female. Upperside white. *Forewing* with the black apical marginal band broader; a large black medial discal spot between the upper and middle median veinlets, this spot extending brokenly above and below these two veinlets; a large similar spot also between the lower median and submedian, below which is an elongated streak on the posterior margin. *Hindwing* with a larger black costal spot than in the male, this spot being pointedly extended below the lower subcostal veinlet; the marginal macular band being composed of larger but shorter and wider separated portions, there is also a small black discal spot between the upper and middle median veinlets. Underside similar to the male. *Body* above greyish-black; thorax, front, and palpi clothed with grey hairs; legs white; antennæ black above, tip of club white, beneath segmented with white.

Expanse, ♂ ♀  $2\frac{3}{4}$  inches.

HABITAT.—Ladak.

DISTRIBUTION.—“Mr. L. de Nicéville’s type was taken by himself at Gya, in Ladak, on July 11th, 1879. Three others which were seen escaped owing to their swift flight” (*l.c.* p. 82). Specimens of both sexes, from Kuruk Tag, Ladak, are in Mr. W. Rothschild’s Collection at Tring. A male and female, from Ladak, taken by Capt. F. E. S. Adair, are in the British Museum Collection. “A single male, the only specimen seen, was taken on the Great Pamir” (de Nicéville, *l.c.* p. 43). The type specimens of *Roborowskii* were taken at “Lob Nor, 2,500 feet, and at Ak Sou, 3,000 feet, Tibet” (*l.c.* 69).



**DANAUS DEVTA** (Plate 518, figs. 3, 3a, ♂, 3b, ♀).

*Mancipium Devta*, de Nicéville, Journ. Asiatic Soc. Bengal, 1883-4, p. 82, pl. 9, fig. 9, ♂, 9a, ♀.

IMAGO.—Male. Upperside white. *Forewing* with the outer margin at the apex to the discoidal nervule marked with black, a similar spot internal to this, and a large roundish spot between the second and third median nervules. *Hindwing* with a black spot on the costa below the first subcostal branch beyond its middle, otherwise unmarked. Underside. *Forewing* as on the upperside, but the outer margin towards the apex marked with greenish and fuscous irrorated scales. *Hindwing* with the basal two-thirds irrorated with greenish and fuscous scales, except an oblong patch from the costa to middle of the cell, which is clear of these scales, the outer margin also marked between the nervules with similar irrorations.

Female. Upperside. *Forewing* with all the markings larger and clearer, there being two additional black spots on the outer margin between the third and second and second and first median nervules; also a diffused spot joined to the large round spot between the second and third median nervules almost reaching the submedian nervure. *Hindwing* with the costal spot also much larger. Underside. *Forewing* differs from the male in having the base of the wing diffused with pale yellow, the apex and costal spot internal to it also suffused with yellow, and a prominent black spot on the disc below the large spot between the second and third median nervules, as on the upperside. *Hindwing* with the base irrorated with pale yellow; and with an irregular discal band, its outer edge in the same position as that edge of the irrorated dark basal portion in the male, this band widest and deepest coloured at the costa, decreasing to the fold below the submedian nervure, irrorated with yellowish fuscous; the outer margin marked with yellowish-fuscous irrorations.

Expanse, ♂  $2\frac{3}{10}$ , ♀  $2\frac{4}{10}$  inches.

HABITAT.—Ladak.

DISTRIBUTION.—“A male and four females were taken by Mr. L. de Nicéville on June 3rd and 4th, 1879, amongst the irrigated fields adjoining the villages of Lama Yuru and Nurla, in Ladak” (*l.c.* p. 82). Two females from Ladak and Kashgar, taken by Capt. F. E. S. Adair, and a male from Samarkand, are in the British Museum Collection. Both sexes were taken by Mr. J. H. Leech at Kiris, in July, at 11,000 feet elevation, and a male was taken by Capt. H. McArthur in the Digha Pass in July, at 11,000 feet elevation.

**DANAUS NAGANUM.**

*Mancipium Naganum*, Moore, Journ. Asiatic Soc. Bengal, 1884, p. 45, ♂.

IMAGO.—Male. Upperside pale yellowish-white. *Forewing* with the base of the



costa sparsely black speckled; a black band at the apex, the inner edge of the band being curved, very slightly irregular, and terminating at the middle median veinlet; a slight black speckled discocellular spot at lower end of the cell, and a small or moderately-large black discal spot between the upper and middle median veinlets. *Hindwing* unmarked. Underside. *Forewing* white, with the apex pale yellow, the cell and discal spot as on the upperside. *Hindwing* pale yellow.

Expanse, 2 inches.

HABITAT.—Naga Hills, Upper Burma.

DISTRIBUTION.—The type specimen from the Naga Hills is in the Indian Museum, Calcutta. A male from Upper Burma, taken by Capt. E. Y. Watson, is in the British Museum.

**DANAUS RAPÆ** (Plate 519, fig. 1, ♂, 1b, c, ♀).

*Pap. Danaus Rapæ*, Linnæus, Syst. Nat. x. ed. p. 468 (1758); *id.* xii. ed. p. 760 (1767).

*Ganoris Rapæ*, Butler, Proc. Zool. Soc. 1881, p. 612. Swinhoe, Trans. Ent. Soc. Lond. 1885, p. 343;

*id.* Proc. Zool. Soc. 1886, p. 431.

*Pontia Mannii*, Meyer, Stet. Ent. Zeit. 1851, p. 151.

*Ganoris Mannii*, Butler, Proc. Zool. Soc. 1880, p. 411; *id.* 1881, p. 612.

IMAGO.—Male. Upperside white. *Forewing* with the base faintly greyish-black scaled; a more or less broad short blackish apical patch, and generally with a small blackish discal spot between the upper and middle median veinlets. *Hindwing* generally with a slightly-defined small greyish-black scaled costal spot. Underside. *Forewing* white, the apex tinted with very pale yellow; a small blackish scaled discal spot, as on the upperside, and also one between the lower median and the submedian vein. *Hindwing* tinted with very pale yellow, and more or less slightly irrorated with minute blackish scales, which are more thickly disposed along lower half of the cell area.

Female. Upperside white. *Forewing* with the apical blackish patch somewhat broader, the discal spot and similar spot between the lower median and submedian always present, and generally there is a slight slender streak below the latter on the posterior margin. *Hindwing* with the costal spot more distinct. Underside similar to the male.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀ 2 to  $2\frac{2}{10}$  inches.

HABITAT.—Europe; W. Asia.

DISTRIBUTION (Within our Area).—A male from Chitral is in Mr. H. Grose-Smith's Collection. We possess specimens of both sexes from Yarkund, males from the Indus Valley, Skardo, and Paskyun in Ladak, taken by Mr. R. B. Shaw. Both sexes, from Kashgar, and a male from Ladak, taken by Capt. F. E. S. Adair, are in



the British Museum Collection. Mr. J. H. Leech obtained it at Dras, 8,000 feet, in June, at Skardo, 8,000 feet, in July, and at Kiris, 11,000 feet, in July. Numerous specimens were obtained by Col. C. Swinhoe in "Quetta, March to May; Goolistan, May; Lora Valley, June; Chaman, S. Afghanistan, in May; Kandahar, January, March, April, October, and November. Common everywhere. Out of many hundred examples I have examined some are referable to *Rapæ* and some to the true type of *Manni*, but there are so many intermediate that it is impossible to separate the two forms" (Tr. Ent. Soc. 1885, 343).

**DANAUS AJAKA** (Plate 519, fig. 2, ♂, 2a, b, ♀, 3 ♂, 3a, b, ♀).

*Pieris Ajaka*, Moore, Proc. Zool. Soc. 1865, p. 490, pl. 31, fig. 16 ♀.

*Ganoris Ajaka*, Butler, Proc. Zool. Soc. 1886, p. 375; *id.* Ann. Nat. Hist. 1888, p. 204. Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 135.

*Pieris Melete*, Elwes, Trans. Ent. Soc. 1888, p. 416. Manders, Trans. Ent. Soc. 1890, p. 534. de Nicéville, Sikkim Gaz. 1894, p. 168. Watson, Journ. Bombay, Nat. Hist. Soc. 1897, p. 669. Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 590.

MALE.—Upperside white. *Forewing* with the costal edge and base irrorated with blackish scales; a black apical decreasing band and a large discal spot between the upper and middle median veinlets—both larger than in *Napi*, also a more or less slightly-defined spot between the lower median and submedian vein. *Hindwing* with a black costal spot; the marginal end of the veins more or less black-lined. Underside. *Forewing* white, the apex pale olivaceous-yellow; veins black-lined; two large black discal spots. *Hindwing* pale olivescence-yellow, the base of costa being bright yellow; veins narrowly or broadly blackish bordered; costal spot more or less indistinct.

FEMALE. Upperside white or olivescence-white, and the base of *forewing* clouded with dusky scales, and on the *hindwing* a few dusky scales clustered across the disc; all the veins on both wings either slenderly or more broadly black bordered, those on the *hindwing*, in some specimens, being dilated at the marginal end. *Forewing* also with the black apical band and two discal spots broader, the upper spot more or less diffusedly coalescent with the apical band, and the lower spot joined to a slender or broad streak extending below the submedian to base of posterior margin. *Hindwing* also with a large black costal spot. Underside similar to the male.

Expanse, ♂ 2 to  $2\frac{4}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—N.W. and E. Himalayas; Assam; Upper Burma; Shan States.

DISTRIBUTION.—Capt. A. M. Lang, R.E., who obtained the type specimens in Lower Kunawur, says, in his MS. Notes, "this is somewhat local and not common, and has not a long-lived brood. It is of very weak flight, affecting low, damp glens, flying



amidst wet herbage near streams in woods. I have taken it at Narkunda, Jarunda, and at Syldung from June to August." We possess a male, labelled Kaschmir, taken by Capt. R. B. Reed. In Mr. J. H. Leech's Collection are specimens from Goorais Valley, 7,000 feet elevation, taken by himself in June, from Narkunda, April, and Rala, in June, taken by Capt. H. McArthur. Col. J. W. Yerbury obtained it at "Murree in August and September. Common in August under the shade of trees. Also common at Thundiani in August" (P. Z. S. 1886, 375; Ann. N. H. 1888, 204). Mr. P. W. Mackinnon records it as "occurring sparingly in Masuri in May and June; a few being also taken by native collectors in the Nila and Bhilung Valleys in July and August" (J. Bombay N. H. Soc. 1898, 590). Col. J. W. Yerbury also took it at Thundiani in May, 1887. Mr. W. Doherty took it at "Naini Tal, Dhankuri, Khati, and Dwali, 6,000 to 11,000 feet elevation, in Kumaon" (Journ. As. Soc. Beng. 1886, 135). Mr. H. J. Elwes records it as being "common in the interior of Sikkim towards Bhotan and the Chumbi Valley, but I never took it in the outer hills of Sikkim. I have obtained it not uncommonly in the Khasias in September" (Tr. Ent. Soc. 1888, 417). Mr. L. de Nicéville says it "occurs only in the interior of Sikkim, and is very rare" (Sikkim Gaz. 1894, 168). Col. C. T. Bingham has received both sexes from Yatung, Tibet. Specimens of both sexes are in Mr. W. Rothschild's Collection, taken in Sikkim in June and July. We possess specimens from Silhet and Cherra Punji, Assam. Col. C. H. E. Adamson took "a single male in the Chin Hill, Burma, in November, at 3,000 feet elevation" (List. Burm. Butt. 1897, 44). Capt. E. Y. Watson records "a single male, taken in May, in the N. Chin Hills, Burma, at 5,000 feet" (Journ. Bombay N. H. Soc. 1897, 669). Dr. N. Manders took "two males and one female at Bernardmyo, Shan States" (Tr. Ent. Soc. 1890, 534).

Of our illustrations on Plate 519, fig. 2 is from a N.W. Himalayan male, and fig. 2a, b, from a female taken by Col. Yerbury in May at Thundiani; figs. 3 and 3a are from the male and female Kunawur types, and 3b from a Cherra Punji female.

**DANAUS CANIDIA** (Plate 520, fig. 1, 1a, b, c, ♂; 1d, e, f, g, h, ♀).

*Papilio Canidia*, Sparmann, Amæn. Acad. vii. p. 504 (1768).

*Pieris Canidia*, Kirby, Syn. Cat. D. Lep. p. 455 (1871). Elwes, Trans. Ent. Soc. 1888, p. 415.

Manders, Trans. Ent. Soc. 1890, p. 534. Leech, Butt. of China, ii. p. 455 (1894). Watson, Journ. Bombay Nat. Hist. Soc. 1897, p. 669. Mackinnon, *id. l.c.* 1898, p. 590, pl. v. fig. 21, *pupa*. de Nicéville, Journ. As. Soc. Bengal, 1902, p. 28.

*Mancipium Canidia*, Moore, Proc. Zool. Soc. 1882, p. 256. Watson, Journ. Bombay N. H. Soc. 1891, p. 51. de Nicéville, Sikkim Gaz. 1894, p. 168. Fruhstorfer, Iris, 1902, p. 276; *id.* Soc. Ent. 1903, p. 25.

*Ganoris Canidia*, Doherty, Journ. As. Soc. Bengal, 1886, p. 135.



*Pieris (Ganoris) Canidia*, Walker, Tr. Ent. Soc. 1895, p. 465.

*Papilio Gliciria*, Cramer, Pap. Exot. ii. pl. 171, fig. E. F, ♂ (1779).

*Pieris Gliciria*, Boisduval, Spec. Gén. Lep. i. p. 524 (1836). Kollar, Hügel's Kaschmir, iv. 2, p. 409 (1844). Doubleday and Hewitson, Gen. D. Lep. i. p. 48 (1847). Moore, Catal. Lep. Mus. E. I. C. i. p. 75 (1857). Lang, Ent. Mo. Mag. 1864, p. 103; *id.* P. Z. S. 1865, p. 490. Moore, P. Z. S. 1874, p. 273.

*Ganoris Gliciria*, Butler, Proc. Zool. Soc. 1881, p. 611; *id.* 1886, p. 375; *id.* Ann. Nat. Hist. 1888, p. 204. Hampson, Journ. As. Soc. Bengal, 1888, p. 362.

*Pieris Glaphyra*, Godart, Encyc. Méth. ix. p. 160 (1819).

*Pieris Napi*, Gray, Lep. Ins. of Nepal, p. 10, pl. 6, fig. 2, ♂ (1846).

*Synchlœ claripennis et sordida*, Butler, Ann. and Mag. Nat. Hist. 1877, p. 96.

IMAGO.—Male. Upperside white. *Forewing* with the base and costa slightly greyish-black scaled; a black apical marginal band, which is deeply sinuous from below the lower subcostal veinlet, a large discal spot between the upper and middle median veinlet, and faint traces of the lower spot of the underside between the lower median and submedian vein. *Hindwing* with a more or less prominent black large costal spot and a series of outer marginal spots. Underside. *Forewing* white, the apex pale olivescence-yellow; base greyish-black scaled; a black middle and lower discal large spot, and a more or less apparent blackish-scaled upper discal spot. *Hindwing* pale olivescence-yellow, more or less distinctly irrorated with minute greyish-black scales—which are more densely packed along lower half of the cell, and also as forming the costal spot, sometimes these scales are more densely packed and border the veins to the outer margin; base of the costa bright yellow.

Female. Upperside white, in some specimens—but very rarely—pale yellowish-white. *Forewing* with the base, including the cell area to near its end, more thickly greyish-black scaled, the black apical marginal band more sharply sinuous, the two discal spots larger and prominent, the upper one sometimes coalesced to the angles of outer band, the lower one joined to a streak below the submedian vein. *Hindwing* with the basal area, including the cell, more or less irrorated with greyish-black scales, some of these scales occasionally also forming a discal cluster between the upper and middle median veinlet; the black costal spot larger and extending below the lower subcostal veinlet; marginal spots larger. Underside similar to the male.

Expanse, ♂  $1\frac{7}{10}$  to  $2\frac{3}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

HABITAT.—North-West, Central, and Eastern Himalayas; S. India; Assam; Upper Burma; Shan States; China; Hong Kong; Hainan; Formosa.

DISTRIBUTION (Within our Area).—It was taken in Kaschmir by Capt. R. Bayne Reed (P. Z. S. 1874, 273). Capt. H. B. Hellard, R.A., obtained it in “Kaschmir, Masuri, and Pangi in Busahur, from June to October” (MS. Notes). Col. J. W. Yerbury records it as “fairly common at Campbellpur in May and June. Also common in October and November” (P. Z. S. 1886, 375); also taken at “Attock



Bridge, Khairabad side, in April; Hassan Abdal in May, and at Thundiani in August" (*id.* Ann. N. H. 1888, 204). Mr. W. Doherty obtained it in the "Kumaon Hills, from 2,000 to 11,000 feet elevation, from the Kali Valley at Jhulaghat up to Garbyan in Byans" (Journ. As. Soc. Beng. 1886, 135). Mr. P. W. Mackinnon records it as "common both at Masuri and in the Dun all the year round" (J. Bombay N. H. Soc. 1898, 590). Capt. A. M. Lang found it "abundant at Umballa in the Plains in January, and up to 10,000 feet altitude everywhere in the N. W. Himalayas" (Ent. Mo. Mag. 1864, 103). We possess a female from Nepal taken by Gen. G. Ramsay. In Sikkim "it is common at 4,000 to 12,000 feet altitude during the rainy season, and found, according to Möller, as low as 3,000 feet from March to December" (H. J. Elwes, Tr. Ent. Soc. 1888, 415). Mr. G. C. Dudgeon obtained it in Bhotan, in May. In South India it is recorded by Mr. G. F. Hampson from the "Nilgiris, being confined to the Plateau" (J. As. Soc. Beng. 1888, 362). Specimens from Ootacamund, Nilgiris, and the Annamully Hills, 3,000 to 4,000 feet altitude, are in the British Museum Collection. Col. C. Swinhoe has specimens of both sexes from Madras. Dr. G. Watt obtained it near Manipur; specimens from the Khasias and Shillong, Assam, are in the British Museum. In Burma, according to Col. C. H. E. Adamson, it is "common throughout the cold weather about Bhamo and among the Hills on the Upper Chindwin River" (List, 1897, 44). Capt. E. Y. Watson found it "common in the North Chin Hills, at from 5,000 to 7,000 feet altitude, in April. A few being also obtained in the Upper Chindwin in April and May" (Journ. Bombay N. H. Soc. 1897, 669). Capt. Watson also took it at "Tilin in December and February, during the Chin-Lushai Expedition of 1889-90" (*id. l.c.* 1891, 51). Dr. Leonard Fea obtained it at Cobago in April, and also at Bhamo. Dr. N. Manders took it in "April, when on the Jatsouk Expedition, and in August at Fort Stedman, Shan States" (Tr. Ent. Soc. 1890, 534).

Of our illustrations on Plate 520, figs. 1, 1a are from a N.W. Himalayan male; 1b, from a Kaschmir male; 1c, Madras male; 1d, a Simla female; 1e, a Madras female; 1f, female; 1g, a Nepal female; and 1h, a Nilgiri female.

CHINA AND JAPAN SPECIES.—*Danaus Cisseis* (Pieris Cisseis, Leech, Entom. 1890, p. 192, ♂; *id.* Butt. of China, Corea, and Japan, ii. p. 455, pl. 43, fig. 5, ♂ (1894). *Habitat.* C. China; Yunnan.—*Danaus Crucivora* (Pieris Crucivora, Boisduval, Spec. Gen. Lep. i. p. 522 (1836). De L'Orza, Lep. Japan, p. 12 (1869). *Syn.* Pieris Orientalis, Oberthür, Etud. Ent. v. p. 13 (1880). P. Mandschuria, Speyer, Stett. Ent. Zeit. 1882, p. 379. Pieris Rapæ, Leech, Butt. of China, etc. ii. p. 456 (1894). *Habitat.* E. China; Corea; Japan.—*Danaus Melete* (Pieris Melete, Ménétriés, Catal. Lep. Mus. Petropol. ii. p. 113, pl. 10, fig. 1, 2, ♂ ♀ (1857). Leech, Butt. of China, ii. p. 448 (1894). *Habitat.* Japan.—*Danaus Aglaope* (Pieris Aglaope, Motsch. Etudes Ent. ix. p. 28 (1860). P. Melete, var. Aglaope, Leech, *l.c.* ii. p. 449.



*Habitat.* Japan.—*Danaus Megamera* (Synchloe Megamera, Butler, Cist. Entom. i. p. 173 (1873). P. Melete, var. Megamera, Leech, l.c. ii., p. 449, pl. 43, fig. 3, 4, ♂ ♀ (1894). *Habitat.* Hakodadi, Japan.—*Danaus Dulcinea* (Ganoris Dulcinea, Butler, Ann. and Mag. Nat. Hist. 1882, p. 18). P. Melete, var. Dulcinea, Leech, l.c. ii. p. 450. *Habitat.* Corea.—*Danaus Orientis* (Pieris Napi, var. Orientis, Oberthür, Etudes Ent. v. p. 13 (1880). P. Melete, var. Orientis, Leech, l.c. ii. p. 450. *Habitat.* Askold.—*Danaus Erutæ* (Pieris Erutæ, Poujade, Ann. Soc. Ent. Fr. 1888, p. 19). P. Melete, var. Erutæ, Leech, l.c. ii. p. 450 (1894). *Habitat.* Moupin.—*Danaus Veris* (Pieris Melete, var. Veris, Staudinger, Rom. Mem. Lep. iii. p. 126, pl. 16, fig. 1, 2 (1887). Leech, l.c. p. 451. *Habitat.* Amurland.—*Danaus Mandarinina* (Pieris Melete, var. Mandarinina, Leech, l.c. ii. p. 451 (1894). *Habitat.* W. China.—*Danaus extensa* (Pieris Erutæ, var. extensa, Poujade, Ann. Soc. Ent. Fr. 1888, p. 19). Pieris extensa, Leech, l.c. ii. p. 454, pl. 36, figs. 4, 5, ♂ ♀, ib. pl. 43, fig. 6, ♂ (1894). Syn. Pieris Eurydice, Leech, Entom. 1891, Suppl. p. 5. *Habitat.* W. and C. China.

#### Genus PONTIA.

- Pontia*, Fabricius, Illiger's Mag. für. Ins. vi. p. 283 (1807). Leach, Edin. Encyc. p. 716 (1815).  
 Ochsenheimer, Schmett. Eur. iv. p. 30 (1816). Samouelle, Ent. U. Comp. p. 236 (1819).  
 Jermyn, Butt. Coll. Vade Mec. pp. 44, 66 (1824).  
*Pontia*, Curtis, Brit. Ent. pl. 48 (1824). Scudder, Proc. Amer. Acad. A. and Sc. 1875, p. 255; *id.*  
 Butt. U. S. ii. p. 156 (1889). Kirby, Allen's Nat. Libr. Butt. ii. p. 151 (1896). Grote, Proc.  
 Amer. Phil. Soc. 1900, p. 38.  
*Pieris* (pt.), Latreille, Gen. Cr. et Ins. xiv. p. 111 (1805); *id.* l.c. iv. p. 203 (1809). Doubleday and  
 Hewitson, Gen. D. Lep. i. p. 42 (1847). Kirby, Eur. Butt. p. 9 (1863). Tutt, Brit. Butt.  
 p. 229 (1896).  
*Ganoris* (pt.), Dalman, Vet. Acad. Handl. 1816, pp. 61, 86.  
*Synchloe* (pt.), Hübner, Verz. bek. Schmett. p. 94 (1816).  
*Mancipium* (pt.), Stephens, Illust. Brit. Ent. Haust. i. p. 22 (1827). Rennie, Consp. p. 4 (1832).  
*Mancipium*, Stephens, Catal. Brit. Lep. B. M. p. 5 (1850).  
*Synchloe*, Schatz, Exot. Schmett. ii. p. 61 (1886).

IMAGO.—*Forewing* triangular; apex obtuse, rounded, exterior margin oblique, posterior margin short; subcostal vein three branched, first and second branches free, upper radial from below the third subcostal branch at nearly half beyond the cell; upper discocellular veinlet short and outwardly-oblique, lower concave, lower radial from their angle; cell long, broad; middle and lower median veinlets widest apart. *Hindwing* short; anterior margin arched, apex and exterior margin convex; cell broad apically; upper discocellular short and oblique, lower concave; upper subcostal short. *Thorax*, head and front finely hairy; palpi very small, hairy beneath to the tip, terminal joint slightly shorter than second; abdomen smoothly



clothed with short scales; antennæ with a rather short club broadening to the tip, compressed and grooved beneath.

EGG.—“Acorn-shaped, with 12 or 14 prominent ribs. Deposited on end.”

LARVA.—“Adult. About 1 inch 3 lines, rather slender, with tubercular black spots, each emitting a black hair. Food plant *Reseda*, N. O. Resedaceæ. Fond of lying at full length along the flower spikes, and several crowded together at the summit in amicable companionship.”

PUPA.—“Seven and a half lines long, thickest across the thorax and end of wing-cases; head with a projecting taper-point; thorax sharply keeled and humped on the back” (Buckler, Brit. Butt. 121 (1886).

TYPE.—*P. Daplidice*.

**PONTIA DAPLIDICE** (Plate 521, fig. 1 ♂, 1a, b, ♀).

*Papilio Daplidice*, Linnæus, Syst. Nat. x. ed. i. p. 468 (1758); *id.* xii. ed. i. 2, p. 760 (1767).

Hübner, Eur. Schmett. figs. 414, 415.

*Pontia Daplidice*, Fabricius, Illiger's Mag. vi. p. 283 (1807). Curtis, Brit. Entom. pl. 48 (1824).

Kirby, Allen's Nat. Libr. Butt. ii. p. 152 (1896).

*Pieris Daplidice*, Godart, Enc. Méth. ix. p. 128 (1819). Boisd. Spec. Gén. Lep. i. p. 544 (1836).

Doubleday and Hewitson, Gen. D. Lep. i. p. 48 (1846). Moore, Catal. Lep. Mus. E. I. C. i.

p. 75 (1857); *id.* Proc. Zool. Soc. 1865, p. 489. Lang, Ent. Mo. Mag. 1868, p. 33. Butler,

Catal. Fabr. Lep. B. M. p. 204 (1869). Bienert, Lep. Ergeb. Reise Persien, p. 26 (1870).

*Mancipium Daplidice*, Stephens, Illust. Brit. Ent. Haust. i. p. 22 (1827); *id.* Catal. Brit. Lep. B. M. p. 5 (1850).

*Synchlœ Daplidice*, Butler, P. Z. S. 1880, p. 410; *id.* Ann. Nat. Hist. 1881, p. 611; *id.* 1882, p. 4.

Staudinger and Schatz, Exot. Schmett. ii. p. 61, pl. 4 (1886). Swinhoe, Trans. Ent. Soc. 1885,

p. 342. Butler, P. Z. S. 1886, p. 375; *id.* Ann. Nat. Hist. 1888, p. 204. Leech, Butt. of

China, ii. p. 458 (1894).

IMAGO.—Male. Upperside greyish-white. *Forewing* with the base slightly irrorated with greyish-black scales; a black large quadrate spot at end of the cell crossed by the slender white discocellular veinlet, an apical black band traversed by four white irregular-shaped spots of which the upper and third are largest and each slenderly extending to the outer margin; in some specimens a faint indication of a lower discal blackish-speckled spot between the lower median and submedian is also present. *Hindwing* with the markings of the underside visible and of a darker tint than the ground colour; sometimes with a slightly indicated greyish-black scaled costal spot and submarginal lunules, these scales also occasionally extending along the tip of the veins to the outer margin. Underside. *Forewing* with the apical white-spotted band less prominent, olivescence-green, its lower portion slightly irrorated with blackish scales, the cell spot less prominent. *Hindwing* olivescence-green, sparsely irrorated with minute black scales; with a large sub-basal costal



spot, a cell spot, a curved discal broken sinuous macular band and marginal row of somewhat quadrate spots.

Female. Upperside white. *Forewing* with the basal area more broadly irrorated with darker scales, the white-spotted black apical band broader, the cell spot larger, the lower discal black spot always present, below which latter is a slender blackish marginal streak. *Hindwing* with the dark markings of the underside distinctly indicated, the basal being greyish-black scaled, the discal macular band and coalesced marginal spots distinctly black-scaled. Underside similar to the male.

Expanse, ♂  $1\frac{6}{10}$  to  $2\frac{2}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

LARVA.—Adult. “Head yellow, round, thickly covered with black dots, each emitting a black hair. Body bluish-grey, with tubercular black spots, each glossy and emitting a black hair; a lateral yellow stripe, not very noticeable, from its low position, and from being interrupted at each segment; spiracles flesh colour with paler whitish centre very inconspicuous and situated on the yellow stripe; belly along the middle glaucous and paler than the green beneath the spiracular stripe.”

PUPA.—“Whitish, with numerous black dots” (Buckler, *l.c.* 121).

HABITAT.—S. Europe; Asia Minor; Persia; S. Asia; W. China; Ladak; Kashmir; W. Himalayas; Afghanistan; Beluchistan.

DISTRIBUTION (Within our Area).—Col. C. Swinhoe records it from “Quetta, in Beluchistan, males and females being taken in May; males also caught in a maize-field near Chaman on August 16th, 1880” (Ann. Nat. Hist. 1882, 4). Col. Swinhoe also obtained it in “Quetta from February to April, and again in August and September; at Goolistan in April; Chaman, May and August; Balgai and Kasian, June; Kandahar, February, April, August, and October. Common everywhere above the Bolan Pass” (Tr. Ent. Soc. 1885, 342). Major Howland Roberts obtained it at “Kokeran, near Kandahar, where it was common in June, frequenting cultivated ground and gardens. It settles suddenly on a flower and is as suddenly off again” (P. Z. S. 1880, 410). Capt. A. M. Lang writes, “This butterfly occurs in the valleys of Upper Kunawur, also in the Spiti Valley, which is geographically, Tibetan. In Spiti and Gughe, the few valleys are oases of barley, millet, and buckwheat for 5 or 6 months in the year; the whole country being perfectly treeless and bare of all vegetation but Artemisia, Astragalus, a few oases and sparse grasses. In these village oases, among the fields, moist and luxuriant from the waters of the snow-rills, this butterfly swarms, but it never leaves the verdure of the villages” (MS. Notes). “I saw this butterfly in considerable numbers, flying about the village fields of cereals and turnips, in the villages on the Spiti River, Leo, Chango, Shialkur, etc., and in the Chinese frontier village of Shipkee” (*id.* P. Z. S. 1865, 489). Dr. Jerdon obtained specimens in the “Valley of Kaschmir” (Ent. Mo. Mag.



1868, 33). Capt. H. B. Hellard took it in the "Valley of Kaschmir and at Goorais, in July, August, and September" (MS. Notes). Col. J. W. Yerbury records it as "common in the neighbourhood of Campbellpur in May and June, and at Hassan Abdal in May" (Ann. Nat. Hist. 1888, 204). Mr. R. B. Shaw obtained it at Paskyam, Ladak, 10,870 feet altitude, during the Yarkand Mission of 1870. Col. C. T. Bingham has received specimens from Chitral, taken in September, 1903. In the British Museum Collection are specimens from Kashgar, taken in November; Ladak, Capt. F. E. S. Adair; and in Mr. J. H. Leech's Collection from Kashmir Valley, taken in June; Goorais Valley, September; Deosai, August; and Western China. Mr. W. B. Pryer obtained it at Shanghai.

**PONTIA GLAUCONOME** (Plate 521, fig. 2, ♂, 2a, b, ♀).

*Pontia Glaucanome*, Klug, Symb. Phys. pl. 7, figs. 18, 19 (1829). Boisduval, Spec. Gén. Lep. i. 546 (1836).

*Pieris Iranica*, Bienert, Lep. Ergeb. Reise Persien, p. 27 (1870).

*Synchlœ Iranica*, Butler, Proc. Zool. Soc. 1880, p. 410, pl. 39, fig. 7, *pupa*. Swinhoe, Trans. Ent. Soc. 1885, p. 343.

*Pieris Vipasa*, Moore, Proc. Zool. Soc. Lond. 1872, p. 565, ♀.

IMAGO.—Male. Upperside greyish-white. *Forewing* with a large quadrate black spot at end of the cell crossed by the white discocellular veinlet; a black apical band traversed by four white spots. *Hindwing* with the markings of the underside indicated by darker greyish-white than the ground-colour; an ill-defined small black-scaled costal spot, two similar anterior submarginal zigzag spots, and a marginal row of four small black dentate spots. Underside white. *Forewing* with the cell spot and apical band as on upperside, the latter pale olive-green except at its lower portion which is black, the veins dividing the band being yellow lined. *Hindwing* with the veins and base of costa yellow lined; two pale olive-green costal cross bars, the inner one being continued across end of the cell and along its lower margin, followed by a similar coloured marginal band enclosing a row of broad white oval spots.

Female. Upperside greyish-white. *Forewing* with the black cell spot larger, and the apical band broader than in the male. *Hindwing* with the markings of the underside more distinctly indicated; the costal spot and marginal markings similar. Underside. *Forewing* as in the male, the apical band being dusky olive-green. *Hindwing* with the veins and base of costa yellow lined as in the male; the basal and outer area dusky olive-green, enclosing a large white subbasal spot, a cell spot, a broad discal sinuous band, and marginal row of white spots.

Expanse, ♂  $1\frac{6}{10}$ , ♀  $1\frac{8}{10}$  inches.

LARVA.—"About 1 inch long. General colour pale green, with longitudinal



yellow bands and black dots ; thickest in the middle, slightly tapering at both ends, has a rough appearance from being ribbed, and is covered with minute hairs. Dorsal and lateral bands dull green, the black dots giving it a blue appearance ; subdorsal band yellow ; spiracular band white, yellow at the junction of the segments. Head pale green with black dots ; a yellow patch on each side, a whitish collar on second segment ; belly pale green ; feet pale green with a yellow mark above each ; spiracles indistinct" (Major Howland Roberts, Proc. Zool. Soc. 1880, 410).

PUPA.—"Attached to the stem or leaf of its food-plant by the tail and also by a thread over the back. A beak-like proboscis turned upward and rather long" (*id. l.c.*).

HABITAT.—S. Arabia ; Persia ; S. Afghanistan ; S. Punjab.

DISTRIBUTION (Within our Area).—Major H. Roberts obtained it at "Kandahar, being common in May and June, frequenting the rocky uncultivated slopes of the Hills, where the food plant grows. The larva was found in the middle of May and June on the wild Mignonette growing on the rocky hills and slopes" (*l.c.* 1880, 410). Col. C. Swinhoe records it from "Kandahar, taken in June" (Tr. Ent. Soc. 1885, 343). We possess two females labelled, Derajat, S.W. Punjab.

Of our illustrations on Plate 521, fig. 2 is from a male, and fig. 2a, b, from the female type of *Vipasa*, from Derajat.

#### Genus PARAPIERIS.

*Parapieris*, de Nicéville, Journ. As. Soc. Bengal, 1897, p. 563.

*Synchlœ* (pt.), Hübner, Verz. bek. Schmett. 94 (1816).

*Synchlœ*, Butler, Cistula Ent. i. pp. 38, 51 (1870). Scudder, Syst. Rev. Amer. Butt. p. 42 (1872).

IMAGO.—*Forewing* less triangular than in *Pontia Daplidice*, the exterior margin being less oblique and the posterior margin longer ; subcostal four branched, the third branch generally, in both sexes, having a short fork near its tip, the upper radial being emitted at fully one-third beyond end of the cell ; median veinlets equidistant. *Hindwing* comparatively longer than in *Daplidice*, the costa not arched, and the apex more regularly convex. Abdomen compactly scaled, and dorsally hairy. Antennæ similar.

TYPE.—P. Callidice.

#### PARAPIERIS CALLIDICE (Plate 521, fig. 3, ♂, 3a, b, ♀).

*Papilio Callidice*, Esper, Schmett. i. 2, pl. 115, figs. 2, 3 (1800). Hübner, Eur. Schmett. i. figs. 468-9, 551-2 (1803).

*Pieris Callidice*, Godart, Encyc. Méth. ix. p. 129 (1819). Boisduval, Spec. Gén. Lep. i. p. 542 (1836). Alpheraky, Rom. Mem. Lep. V. p. 98 (1889).

*Synchlœ Callidice*, Doherty, Journ. As. Soc. Bengal, 1886, p. 135. Leech, Butt. of China, ii. p. 459 (1894).



*Parapieris Callidice*, de Nicéville, Journ. Asiatic Soc. Bengal, 1897, p. 563; *id.* Journ. Bombay Nat. Hist. Soc. 1898, p. 590.

*Pieris Chrysidice*, Herr. Schæff. Eur. Schmett. i. figs. 200-3 (1844).

*Pieris Kalora*, Moore, Proc. Zool. Soc. Lond. 1865, p. 489, pl. 31, fig. 15, ♂.

IMAGO.—Male. Upperside greyish-white. *Forewing* with the base slightly greyish-black scaled; a black narrow quadrate spot at end of the cell crossed by the discocellular veinlet, a transverse upper-discal and an apical-marginal series of small black dentate spots, which are anteriorly slightly coalesced at their vein angles; sometimes a few blackish scales are present between the lower median and submedian vein. *Hindwing* with the base greyish-black scaled; without markings. Underside white. *Forewing* with markings as on upperside, but less prominent, the apical pale olive-brown and slightly coalescent anteriorly. *Hindwing* with all the veins broadly bordered with pale olive-brown sparsely irrorated with minute black scales, leaving a white elongated subbasal costal spot, one within the cell, and a discal series of lanceolate marks and marginal oval pointed-spots.

Female. Upperside greyish-white. *Forewing* with the basal area darker greyish-black scaled; the black cell-spot larger and broader, the discal transverse band continuous and extending to the posterior margin, being slightly broken only at the lower median veinlet, the marginal band also extends to the posterior angle, both bands coalescing at their vein angles. *Hindwing* with the base and all the veins broadly greyish-black scaled; a darker black upper submarginal zigzag band; the basal, discal, and inter-marginal spaces forming a series of ill-defined whitish inwardly-pointed spots. Underside similar to the male, except that on the *forewing* the cell-spot is larger, and both outer bands extend more continuously to the posterior margin. *Hindwing* as in the male.

Expanse, ♂  $1\frac{8}{10}$  to 2, ♀ 2 to  $2\frac{4}{10}$  inches.

HABITAT.—S.E. Europe; N.E. Asia Minor; N. Persia; N.W. Himalayas; S.W. China.

DISTRIBUTION (Within our Area).—Capt. A. M. Lang, in his MS. Notes, states this to be “an alpine species of the Kunawur and Tibet frontier, not a village butterfly, as is *P. Daplidice*, but only to be seen on the edges of glaciers and deep snow-beds in company with *Parnassius*. I have only seen it in two localities, the Ronang and Hungrung Passes in Upper Kunawur. Only one stray specimen I caught on the latter, whereas on the former a good number were flying. It is apparently a local species.” “On the Hungrung Pass, 15,000 feet elevation, one I saw was flying very fast at the top of the Pass over the dwarf Tibetan Furze (*Carayana versicolor*). On the next Pass, the Runang, about 14,000 feet, a good many were flying very fast up and down the bare stony slopes just at the summit of the Pass. I never saw the insect again, unless on the Tari Pass into Spiti, 15,000 feet, over glaciers and snow-



beds, where the rarified air prevented any pursuit of insects, but where I saw some fast-flying white butterflies which I could not secure" (P. Z. S. 1865, 489). In another Note, Capt. Lang says, "taken on the Runang, Hungrung, and Kongma Passes in June and July." Mr. L. de Nicéville records its capture on the "northern side of Darkot Pass, about 12,000 feet elevation" (Rept. Pamir Exped. 1898, 42). Capt. H. B. Hellard, R.E., obtained it in Kashmir, on the Rajdiangan Pass, about 10,000 feet; Gungabul Lake, about 13,000 feet; Sarsungar and Stakpila Passes; taken in July and September" (MS. Notes). Mr. W. Doherty took "two males on the Pindari Glacier, 12,000 feet elevation, N.W. Kumaon, in September" (Journ. As. Soc. Beng. 1886, 135). In the British Museum Collection are specimens from Chitral, taken by Captain G. H. Colomb; Ladak, Capt. F. E. S. Adair; Hunza, Mr. Conway; and in Mr. J. H. Leech's Collection, from Zojji La, taken in June, and Skardo, in July. In Mr. W. Rothschild's Collection are specimens of both sexes, labelled, Kulu. Mr. P. W. Mackinnon records it from the Western Himalayas, as being "found at high elevations only far in the interior near the snows, in the Nila and Baspa Valleys, and from the Nilung Village, all at about 12,000 feet elevation, in July and August" (J. Bombay N. H. Soc. 1898, 590).

#### PARAPIERIS CHLORIDICE.

*Papilio Chloridice*, Hübner, Eur. Schmett. i. figs. 712, 713 (1803-18).

*Pieris Chloridice*, Duponchel, Lep. Fr. Suppl. i. pl. 4, figs. 3-5 (1832). Boisduval, Spec. Gén. Lep. i. p. 543 (1836). Lederer, Horæ Soc. Ent. Ross. 1869, p. 74. Bienert, Lep. Reise Pers. p. 28 (1869).

*Synchlœ Chloridice*, Leech, Butt. of China, ii. p. 459 (1894).

IMAGO.—Male. Upperside greyish-white. *Forewing* with a black lunate-bar at end of the cell crossed by the white discocellular veinlet; a short oblique subapical black-scaled sinuous band extending from the costa to the discoidal veinlet, and which is partly coalesced to an apical-marginal row of decreasing spots. *Hindwing* with the markings of the underside indicated by a greyish tint darker than the white ground-colour. Underside white. *Forewing* with the cell lunate-bar and apical markings as on the upperside, the latter less prominent and pale olive-green. *Hindwing* with all the veins broadly bordered with pale olive-green, leaving a white subbasal costal obliquely-curved streak, a narrow spot within the cell, an irregular-curved discal sinuous band, and a marginal row of broad dilated spots.

Female. Upperside. *Forewing* with the black cell-bar, the subapical sinuous band and apical-marginal spots larger and blacker; a lower-discal black spot being present between the lower median and submedian vein. *Hindwing* with the basal markings of the underside indicated as in the male, but the upper-discal and



the marginal are distinctly black. Underside similar to the male, except that on the *forewing* the lower discal spot is also present.

Expanse, ♂ ♀  $1\frac{8}{10}$  inch.

HABITAT.—Asia Minor; Persia; Beluchistan; S. Russia; Kashgar; Ladak; Tibet; S.W. China.

DISTRIBUTION (Within our Area).—In the British Museum Collection are specimens from Quetta, Beluchistan, Kashgar, and Ladak, taken by Capt. F. E. S. Adair. In Mr. J. H. Leech's Collection are both sexes from Chonging Valley, 17,000 feet elevation, taken in July, and from Digba Pass, 15,000 feet, by Capt. H. McArthur. We possess a specimen from Sirikol; and Mr. H. Grose-Smith has both sexes from Chitral.

**PARAPIERIS CHUMBIENSIS** (Plate 522, figs. 1, 1a, ♂).

*Parapieris Chumbiensis*, de Nicéville, Journ. Asiatic Soc. Bengal, 1897, p. 563, pl. i. fig. 6, ♂.

*Pieris Dubernardi*, Elwes, Trans. Ent. Soc. Lond. 1888, p. 415, *nec* Oberthür.

*Mancipium Dubernardi*, de Nicéville, Sikkim Gaz. 1894, p. 168.

IMAGO.—Male. Upperside white, the base thickly sprinkled with black scales; cilia white. *Forewing* with the base of costa black scaled, the veins also slightly black scaled; a black slender inwardly-dentate streak bordering the lower discocellular veinlet; an apical marginal decreasing dentated band, a large rounded discal spot between the upper and middle median veinlets, and a small cluster of a few slightly-defined blackish scales in the interspace below it. *Hindwing* with the veins slightly black lined; a rounded black-scaled apical costal spot below which is a slightly-defined discal series of two or three small clusters of black scales; a few black scales are also marginally sprinkled at the vein ends. Underside. *Forewing* white; all the veins black lined; the black apical band indicated by the dilatation of the marginal end of the veins; the discal spot as above, and with a slightly-defined lower cluster of scales extending to the submedian vein; the discocellular streak broader and bordering both veinlets. *Hindwing* pale ochreous-yellow; base of costa chrome-yellow; all the veins broadly black bordered, leaving an elongated yellow subbasal and cell streak, narrow discal streaks, and broader marginal streaks, the discal points of the two latter series being slightly coalescent.

Female. Unknown.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

HABITAT.—Chumbi, E. Tibet.

DISTRIBUTION.—Mr. H. J. Elwes records "eight or nine male specimens of this species which were obtained by a native collector employed by the late Capt. Harman, R.E., in surveying the Tibetan frontier" (*l.c.* p. 415).



Our illustration on Plate 522, fig. 1, 1a, is from a male in our possession received from Mr. Elwes.

CHINESE SPECIES.—*Parapieris Dubernardi* (Pieris Dubernardi, Oberthür, Etudes Ent. ix. p. 13, pl. 1, fig. 6, ♂ (1884). *Aporia Dubernardi*, Leech, Butt. of China, ii. p. 467, pl. 36, fig. 8, ♀ (1894). *Habitat.* W. China.—*Parapieris Davidis*, (Pieris Davidis, Oberthür, Etud. Ent. ii. p. 18, pl. 1, fig. 5, ♂ (1876). Leech, Entom. 1891, Suppl. p. 57. *Aporia Davidis*, Leech, Butt. of China, ii. p. 468, pl. 36, fig. 1, ♂ (1894). *Pieris Davidina*, Oberth. Etud. Ent. xv. p. 8, pl. 3, fig. 20 (1891). *Habitat.* W. China; E. Tibet.—*Parapieris Venata* (Pieris Davidina var. *Venata*, Leech, Entom. 1891, Suppl. p. 58. *Aporia Davidis* var. *Venata*, Leech, Butt. of China, ii. p. 469, pl. 36, fig. 3, ♀ (1894). *Habitat.* W. China.

#### Genus BALTIA.

*Baltia*, Moore, Ann. and Mag. Nat. Hist. 1878, p. 288. Kirby, Entomologist, 1894, p. 100; *id.* Allen's Nat. Libr. Butt. ii. p. 156 (1896). Dixey, Trans. Ent. Soc. Lond. 1894, pp. 249, 334.

MALE. Wings small. *Forewing* short, triangular; costa considerably arched from the base, apex and posterior angle rounded, exterior margin oblique; costal vein short; subcostal vein arched to end of the cell, four-branched, the first and second branches free and arising at equal distance apart before end of the cell and terminating on the costa before the apex; third branch bifid, bent slightly at some distance beyond end of the cell, at its middle, and again immediately before its termination before the apex, the fourth and upper radial each starting respectively below from these angles, the fourth branch being very short, the lower radial also emitted from the subcostal at some distance beyond end of the cell (in the female the lower radial starts either from the upper end of the cell, or at some distance beyond as in the male). Cell broad; discocellular oblique, slightly bent inward in its middle; median vein three-branched, the branches at equal distances apart; submedian curved. *Hindwing* rather long, somewhat oval, slightly broader than the forewing; apex and exterior margin very convex, the abdominal margin long; costal vein short; subcostal two-branched; cell broad; discocellulars oblique, upper shortest, the radial from their angle; median three-branched; upper submedian nearly straight, lower short. *Body* small; abdomen short, compactly scaled; thorax and front of head clothed with long lax hairs; palpi very long, slender, densely hairy beneath; legs short, claws bifid; femora fringed beneath with long lax hairs; antennæ short, the club large, rather long, spatulate, and compressed.

TYPE.—B. Shawii.

#### BALTIA SHAWII (Plate 522, fig. 2, 2a, ♂, 2b, c, ♀).

*Mesapia Shawii*, Bates, Henderson and Hume's, Lahore to Yarkand, p. 305, ♀ (1873). Staudinger and Schatz, Exot. Schmett. ii. p. 59 (1886).



*Baltia Shawii*, Moore, Ann. and Mag. Nat. Hist. 1878, p. 288, ♂ ♀; *id.* Sci. Results Yarkand Exp. Lep. p. 3, pl. 1, fig. 5, ♂ (1879). Kirby, Entom. 1894, p. 100; *id.* Allen's Nat. Libr. Butt. ii. p. 156 (1896).

IMAGO.—Male. Upperside white; base of both wings densely black scaled. *Forewing* with the costal edge ochreous and slightly black speckled; a black large triangular oblique spot at end of the cell, a short transverse subapical black band, and a marginal row of black decreasing triangular spots. *Hindwing* with a very slender slightly black streak at end of the cell, an indistinct curved discal band formed by sparsely speckled minute greyish-black scales. Underside. *Forewing* with markings as above, the costa and exterior margin being tinged with ochreous. *Hindwing* sparsely speckled with minute black scales, which are more densely packed at the base, and also form an indistinct narrow curved discal and a marginal macular band; a slender black-speckled streak at end of the cell. *Body* black; palpi ochreous above, fringed with black hairs beneath; abdomen beneath white; legs black above, white beneath; antennæ black, the stem white ringed.

Female. Upperside sparsely speckled with minute black scales. *Forewing* with the black cell spot slightly larger, the discal and marginal band being continued across the wing. *Hindwing* with the cell streak broader, the discal black scaled macular band more distinct, these black scales also form an ill-defined macular marginal band. Underside similar to the upper.

Expanse, ♂  $1\frac{3}{10}$  to  $1\frac{5}{10}$ , ♀  $1\frac{4}{10}$  inch.

HABITAT.—Extreme North-Western Himalayas; Ladak.

DISTRIBUTION.—The type specimen, described by Mr. H. W. Bates, was taken by Mr. R. B. Shaw on the Chang Lung Pass, Ladak, at 18,000 feet elevation, during the Yarkand Expedition of 1870. A male was taken at Ak Tagh, north of Karakoram Pass, at 15,000 feet, in June, 1874, by Dr. F. Stoliczka. Specimens of both sexes from North Kashmir are in the Collection of Mr. W. Rothschild and of Mr. H. Grose-Smith. In Mr. J. H. Leech's Collection are several specimens of both sexes from the Karakoram, 18,000 feet, taken in July by Capt. H. McArthur.

**BALTIA BUTLERI** (Plate 522, fig. 3, 3a, ♂, 3b, ♀).

*Synchlœ Butleri*, Moore, Proc. Zool. Soc. Lond. 1882, p. 256, pl. xi. fig. 6, 6a, ♂.

*Baltia Butleri*, Kirby, Entom. 1894, p. 100; *id.* Allen's Nat. Libr. Butt. ii. p. 156 (1896).

IMAGO.—Male. Upperside white; basal area of both wings deeply black scaled. *Forewing* with a black narrow bar at end of the cell, a short subapical discal band and an apical-marginal row of more or less distinctly-formed small dentate spots. *Hindwing* with a black broken streak at end of the cell, a very indistinct sparsely black-scaled curved discal macular fascia and marginal marks—indicating those of



the underside. Underside. *Forewing* with the costal edge and the interspaces longitudinally between the apical bands very pale reddish-ochreous; the black cell-bar and apical bands paler than on upperside, the marginal marks being divided by the pale vein ends. *Hindwing* very pale reddish-ochreous, with blackish streaks bordering the veins, these streaks outwardly-forming on the disc and on the outer margin a series of short duplex streaks, each pair being divided by the pale vein; broken cell streak larger. *Body* black; front of head pale reddish-ochreous; palpi whitish and fringed with blackish hairs; legs whitish; abdomen white beneath; antennæ black, shaft ringed with white.

Female. Upperside white. *Forewing* with the black cell-bar slightly broader, the discal transverse band and the marginal spots extending to the submedian vein, their apical portions being more or less slightly coalescent along the veins. *Hindwing* with the black cell-streak broader and less broken, the basal area and the cell borders more broadly black-scaled, the discal curved macular band distinctly black, and the marginal marks blackish-scaled. Underside similar to the male, except that on the *forewing* the outer bands extend to the submedian vein.

Expanse,  $1\frac{5}{10}$  to  $1\frac{6}{10}$  inch.

HABITAT.—N.W. Himalayas.

DISTRIBUTION.—The type specimen was obtained in Lahoul by the Rev. J. H. Hocking. We possess a male from Ladak. Mr. W. Rothschild has several examples of both sexes from N. Kaschmir. Mr. H. Grose-Smith also has it from the same locality. In Mr. J. H. Leech's Collection are both sexes from the Digba Pass, N. side, 15,000 feet, June; Kardong Pass, 15 to 17,000 feet, August; and Karakoram, 18,000 feet, July, all taken by Capt. H. McArthur.

ALLIED SPECIES.—*Baltia Baitalensis* (Pieris Shawi, Gr.-Grshimailo, Rom. Mem. Lep. iv. p. 222, pl. 10, fig. 2a, b, ♂ ♀ (1890).—*nec* Bates. *Habitat.* Ak Baital, Kara Koul, Turkestan.

*Baltia Potanini* (Pieris Potanini, Alpheraky, Stett. Ent. Zeit. 1888, p. 66). *Syn.* P. *Butleri*, Alpheraky, Rom. Mem. Lep. v. p. 99, pl. 5, fig 2, a, b, ♂ ♀ (1889). Male. Larger than same sex of *Butleri*. Upperside. *Forewing* with similar black discocellular bar and apically-dilated anterior veins only, the contiguous upper-discal short black band being absent. *Hindwing* with the black discocellular bar less defined and its two ends distinctly, medially disconnected; the dusky shades bordering the outer veins being either less distinctly interrupted across the disc or continuous from their base to tip. Underside. *Forewing* with the black cell-bar broken in its middle, with similar apical vein-borderings, but no upper-discal fascia apparent. *Hindwing* with the black bordering to the veins, but those of the outer series being either less interrupted or entire—and thus form a more linear unbroken series of streaks. Female. Upperside either white or tinted with very



pale yellow. Both wings similar marked as in *Butleri*, the markings being comparatively broader. Underside similar to the male. Expanse, ♂  $1\frac{5}{10}$  to 2 inches, ♀  $1\frac{8}{10}$  inch. *Habitat*. Nian-Chan, Koko Nor, W. China.

Genus MESAPIA, Gray, List. Lep. Ins. Brit. Mus. i. p. 92 (1856). Kirby, Catal. D. Lep. p. 510 (1871); *id.* Allen's Nat. Libr. Butt. ii. p. 154 (1896). Schatz, Exot. Schmett. ii. p. 59 (1886). Leech, Butt. of China, ii. p. 659 (1894).—*Mesapia Peloria* (Pieris Peloria, Hewitson, Exot. Butt. i. pl. 2, fig. 15, 16 (1853). Kirby, Entom. 1894, p. 101; *id.* Allen's Nat. Libr. Butt. ii. p. 155 (1896). Leech, Butt. of China, ii. p. 659 (1894). Jordan, Nov. Zool. v. p. 381 (1898). Aporia Peloria, Fixsen, Rom. Mem. Lep. v. p. 97 (1889). *Syn.* Aporia Lama, Alpheraky, Rom. Mem. Lep. ii. p. 404 (1887). *Habitat*. N.E. Tibet.

Genus DAVIDINA, Oberthür, Etudes Ent. iv. pp. 19, 108 (1878). Schatz, Exot. Schmett. ii. p. 59 (1886). Leech, Butt. of China, ii. p. 474 (1894). Kirby, Allen's Nat. Libr. Butt. ii. p. 156 (1896).—*Davidina Armandi*, Oberthür, *l.c.* pp. 19, 108, pl. 2, fig. 1 (1878-9). Leech, *l.c.* p. 474, pl. 33, fig. 9, ♂ (1893). Kirby, *l.c.* p. 157 (1896). *Habitat*. Central China.

#### Genus PIERIS.

*Heliconius*, Barbut, Gen. Ins. Linné, p. 109 (1781). *nec* Linnæus.

*Pieris* (sect. 3, pt.), Schrank, Fauna Boica, ii. 1, pp. 152, 160 (1801).

*Pieris* (pt.), Latreille, Sonn. Buff. xiv. p. 111 (1805); *id.* Gen. Cr. et Ins. iv. p. 203 (1809).

Lamarck, Hist. Nat. Anim. iv. p. 30 (1816). Boisduval, Spec. Gén. Lép. i. p. 434 (1836).

Doubleday and Hewitson, Gen. D. Lep. i. p. 42 (1847).

*Pieris*, Jermyn, Butt. Coll. Vade Mecum, pp. 43, 66 (1824). Stephens, Illust. Brit. Ent. Haust. i. p. 25 (1827). Curtis, Brit. Ent. pl. 360 (1831). Rennie, Consp. p. 5 (1832). Westwood, Intr. Class. Ins. ii. Gen. Syn. p. 87 (1840).

*Aporia*, Hübner, Verz. bek. Schmett. p. 90 (1816). Stephens, Catal. Brit. Lep. B. M. p. 3 (1850).

Stainton, Manual Brit. Butt. i. p. 17 (1857). Kirby, Eur. Butt. p. 8 (1863); *id.* Allen's Nat. Libr. Butt. ii. p. 139 (1896). Schatz, Exot. Schmett. ii. p. 60 (1886). Scudder, Proc. Amer. Acad. A. and Sci. 1875, p. 116. Tutt, Brit. Butt. p. 225 (1896). Grote, Proc. Amer. Phil. Soc. 1900, p. 26.

*Ganoris* (pt.), Dalm. Vet. Akad. Handl. 1816, pp. 61, 86.

*Pontia* (pt.), Samouelle, Ent. U. Comp. p. 236 (1819).

*Leuconea*, Donzel, Ann. Soc. Ent. Fr. vi. p. 80 (1837). Duponchel, Catal. Méth. Lep. Eur. p. 24 (1844). Rambur, Catal. Lep. Andal. p. 54 (1858).

*Pontia*, Butler, Cistula Entom. i. pp. 38, 50 (1870); *id.* Proc. Zool. Soc. 1872, p. 58.

IMAGO.—Wings uniformly covered with very minute closely-adpressed scales; almost subdiaphanous; cilia almost obsolete. *Forewing* elongated, triangulate, apex and posterior angle rounded, exterior margin slightly oblique; subcostal vein four branched, first branch free and emitted at about one-fifth before end of the



cell, second immediately before the end, and third from end of cell, third with a short fork near its end, the upper radial being emitted from the subcostal at fully two-thirds beyond the cell; the cell broad, longest in the male; discocellulars oblique, very slightly concave, upper short, the lower radial from their angle; middle and lower median much the widest apart; submedian vein well recurved. *Hindwing* broadly oval, somewhat prolonged apically, and very slightly obtusely-angular at end of lower subcostal branch in the male, the angulation being more apparent in the female; cell long, broad across the middle and truncate at its end; discocellulars very oblique; first subcostal branch short; submedians long. *Thorax* densely clothed with fine hairs; abdomen of male above compactly scaled laterally, with a dorsal ridge of short fine hairs, and a similar series beneath; palpi short, hairy beneath, terminal joint slender, as long as the second; antennæ with a lengthened fusiform compressed club.

LARVA.—Stout, cylindrical, clothed with short fine hairs. When young living gregariously under a common silken web. Feeds on Hawthorn, Sloe, and various Fruit trees.

PUPA.—Rather stout; head obtusely pointed in front; thorax dorsally convex.

TYPE.—P. Cratægi.

**PIERIS SORACTA** (Plate 523, fig. 1, *larva* and *pupa*; 1a, b, c, d, ♂, 1e, f, ♀).

*Aporia Soracta*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 83 (1857). Lang. Ent. Mo. Mag. 1864, p. 102. Moore, P. Z. S. 1865, p. 489; *id.* Proc. Zool. Soc. 1882, p. 256, pl. 11, fig. 5, *larva*. Doherty, Journ. As. Soc. Bengal, 1886, p. 135. Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 589.

*Pontia Soracta*, Butler, Proc. Zool. Soc. Lond. 1878, p. 58.

IMAGO.—Male. Upperside white; extreme outer margin and cilia black, edged with grey. *Forewing* with the costal-edge and the veins slenderly black lined, more distinctly so along their outer end; a black variable slender or moderately-broad streak at end of the cell, this streak sometimes extending more slenderly at both ends, from the base of first subcostal branch to the lower median branch, its outer edge being also angled at base of each veinlet except the lower median, and sometimes also prominently extending along the upper and middle median to, and coalescing with the transverse band; a black transverse discal sinuous band from the costa to lower median veinlet, this band is very variable, being either almost obsolete, or slightly, or prominently defined, the outer margin of the wing being narrowly black and inwardly angled at the veins, these two bands, in the prominently marked specimens, enclosing a series of submarginal oval spaces. *Hindwing* with the veins entirely white and unmarked or with the veins black lined



for some distance from their outer end, and with a discal curved series of intervening blackish-speckled points. Underside. *Forewing* white; veins and markings similar to the upperside, but less prominent. *Hindwing* either white, with the base of costa yellow, with the veins slenderly black-lined, or the ground-colour is discally tinted with pale yellow and the veins more broadly black lined than on upperside, and the discal row of black points present. *Body* blackish; thorax, head, and palpi whitish haired; antennæ black, with the tip white; legs black, femora white streaked.

Female. Upperside white, with the veins slenderly black lined. *Forewing* with less defined blackish cell streak, transverse discal and marginal markings. *Hindwing* unmarked. Underside similar to the upperside, the veins on hindwing more distinctly black lined.

Expanse, ♂  $2\frac{1}{4}$  to  $2\frac{3}{4}$ , ♀  $2\frac{3}{4}$  inches.

HABITAT.—N.W. Himalayas.

LIFE HISTORY.—“Larva found at Masuri, 7,000 feet elevation, in the latter half of April and beginning of May, feeding in large numbers, socially, on *Berberis*.”

ADULT LARVA.—“Length 1 inch. Uniformly cylindrical, pubescent; yellowish-grey, with a broad black dorsal band, which contains two fine longitudinal yellow lines, this black dorsal band extends from the second to eleventh segment inclusive, it is bordered with a narrow yellow margin, below which the sides are pale lilac-grey minutely irrorated with darker. An interrupted yellow line above the feet, margined above and below with black dots; from above the feet project horizontal and decumbent white hairs, forming a continuous decumbent fringe above the feet. Head blackish with yellowish pubescence; legs and prolegs fuscous; spiracles and incisions of segments inconspicuous.”

PUPA.—“Length 9 lines. Braced. Usual Pieridan form; angulated; vertex acutely pointed, sternum produced into a nasiform protuberance; creamy-white on dorsal and pale lavender-grey on ventral surface; an interrupted yellow lateral line separating these two colours; speckled with black points forming more or less interrupted longitudinal lines; wing-cases clear white, with narrow margins and submarginal series of spots on exterior margin; also median vein and two spots adjacent, black; margins of the eyes, palpi, legs, antennæ, and apex of nasiform sternal projection also black.”

IMAGO.—“Emerged on May 15th and following days” (Capt. A. M. Lang, MS. Notes).

DISTRIBUTION.—“A Himalayan species, and may be seen in some abundance in forests, at altitudes of 6,000 to 8,000 feet. It is essentially a forest insect, not affecting gardens or grassy slopes” (Cap. A. M. Lang, P. Z. S. 1865, 489). Col. J. W. Yerbury obtained it at Kala Pani and at Thundiani in May. In the British Museum Collection is a male from Gilgit, N. of Kashmir, taken by Col. Biddulph,



a male from Dalhousie, taken by Col. Harford in May, and in Mr. J. H. Leech's Collection are both sexes from Huttee, 4,000 feet, taken in May; from Murree, 6,000 feet, in May; Kujiar, 6,000 feet, April; Dana, N. of Dalhousie, in June and August; and from Kardong, 14,000 feet, S. of Leh, Ladak, taken by Capt. H. McArthur. Capt. H. B. Hellard took it at Masuri. Mr. W. Doherty records it from "Pindari Valley, 9,000 feet, N.W. Kumaon" (*l.c.* 135). The Rev. J. H. Hocking records it from "Dharmasala, the larvæ being found feeding on the Kusmul (*Berberis*) on April 6th, and changing to pupæ on May 8th (P. Z. S. 1882, 256). Capt. Lang found and reared the larva at Masuri, in April and May. Mr. P. W. Mackinnon records it as "occurring in vast numbers for a very short time in April and May in Masuri and in the interior. The larva feeding on *Berberis Lycium*. It is of a brown colour, covered with fine and soft hairs. The pupa varying much in colour, some being reddish-brown, others almost white" (*l.c.* 589).

Of our illustrations on Plate 523, fig 1 is from the larva reared by Mr. Hocking, and the pupa from Capt. Lang, 1a, b, a male from Thundiani, 1c, d, a male from Masuri, and 1d, e, a female from Simla.

#### PIERIS LEECHII.

IMAGO.—Male and female. Smaller than typical *Soracta*. Upperside. *Forewing* with the black discocellular-bar much broader, the submarginal band also broader and is continuous in its course from the costa to the lower median veinlet, the enclosed series of white spots are also complete. Underside. *Forewing* with the outer veins broader black, as on the upperside, than in *Soracta*, the submarginal band complete and well defined, the apex tinted with pale yellow. *Hindwing* uniformly pale yellow, with all the veins broadly black, the discal zigzag black band also broader and well-defined.

Expanse, ♂ ♀  $1\frac{3}{4}$  to  $2\frac{1}{4}$  inches.

HABITAT. Skoro La, N. of Skardo, Ladak; Gilgit.

Described from several specimens of both sexes, taken by Mr. J. H. Leech at Skoro La, 12,000 ft. elevation, in July, 1887. Col. C. T. Bingham has recently received several specimens from Gilgit.

#### PIERIS BELUCHA.

*Aporia Belucha*, Marshall, Proc. Zool. Soc. Lond. 1882, p. 760. Swinhoe, Trans. Ent. Soc. 1885, p. 342. Grose-Smith, Rhop. Exot. i. p. 7, *Pieris* pl. 2, fig. 8, 9, ♂ (1889).

*Metaporia Sorex*, Grose-Smith, Ann. Nat. Hist. 1887, p. 129.

? *Pieris Leucodice*, Bienert, Lep. Reise in Persien, p. 26 (1869).

IMAGO.—Male. Smaller than *Soracta*. Upperside white. *Forewing* with the



veins slenderly black lined, the black cell-streak broader, the transverse discal and its marginally-united black band also broad, with the enclosed series of white spots more sharply defined. *Hindwing* with the end of the outer veins distinctly black-lined; a discal curved row of blackish speckled points, and a few black scales edging the discocellular veinlet. Underside. *Forewing* similar to the upperside, except that the outer bands are narrower. *Hindwing* pale yellow, the base of costa chrome-yellow; all the veins black bordered; the curved series of discal points prominent.

Expanse, ♂  $1\frac{8}{10}$  inch.

HABITAT.—Beluchistan; ? Persia.

DISTRIBUTION.—Mr. H. Grose-Smith's type specimen is recorded from Quetta. Capt. A. M. Lang obtained it in the Ziarut Pass, Kwass Valley, at 8,000 feet altitude, in June. In Mr. J. H. Leech's Collection are specimens labelled "Persia," which are probably referable to this species.

**PIERIS NABELLICA** (Plate 524, fig. 1, ♂, 1a, b, ♀).

*Pieris Nabellica*, Boisduval, Spec. Gén. Lep. i. p. 509 (1836). Lang, Ent. Mo. Mag. 1868, p. 33.

*Metaporia Nabellica*, Butler, Proc. Zool. Soc. 1878, p. 61.

*Aporia Nabellica*, Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 589.

IMAGO.—Male. Upperside greyish-black; cilia edged with grey. *Forewing* with an upper discal series of very slightly apparent whitish-scaled short longitudinal streaks beyond the cell, and a submarginal transverse curved row of prominent white-scaled spots. *Hindwing* with the veins, basally, slenderly white lined, and a submarginal row of inwardly-indented quadrate white spots. Underside. *Forewing* black, the discal and marginal white spots prominent, those at the apex being yellow tinted; interior of cell whitish scaled. *Hindwing* pale yellow; the costal base bright yellow; all the veins broadly black bordered, enclosing a pale yellow elongated cell streak, a subcostal streak, a discal series of streaks, and then an outer marginal row of indented quadrate spots. *Body* black; thorax and front clothed with fine greyish silky hairs; abdomen beneath greyish-white; antennæ black, the tip of club ochreous-white; legs black.

Female. Upperside similar to the male, except that on the *forewing* the cell and lower base is more or less greyish-white scaled, the discal spots as prominently white as the marginal, those of the former extending more or less diffusedly to the posterior margin, and on the *hindwing* the cell and disc is more or less prominently interspaced with white streaks. Underside similar to the male, except that on the *forewing* the discal spots extend to the posterior margin.

Expanse, 3 to  $3\frac{1}{4}$  inches.



HABITAT.—N.W. Himalayas.

DISTRIBUTION.—Capt. A. M. Lang records it as “occurring but sparingly in Kunawur, where I captured it at altitudes of about 9,000 or 10,000 feet, in the Wungur, Kazhang, and Buspa Valleys. It has a slow, heavy flight, and is fond of pitching on the late Umbelliferous plants, which arise above the dense masses of flowers carpeting the glades in these wooded valleys during the rainy months of July and August. Specimens from Kaschmir appear to be lighter in colour than those from Kunawur” (Ent. Mo. Mag. 1868, 33). Capt. H. B. Hellard obtained it in “Pangi, Busahir, in July and August, in the Rajdiangan Pass, and in Gulmurg, in Kaschmir, in August and September” (MS. Notes). Mr. P. W. Mackinnon records it as “very rare, obtained only at 12,000 or 13,000 feet elevation, on the slopes of the Hills above the Buspa Valley and on the Borenda Pass, in July and August” (J. Bombay N. H. Soc. 1898, 589). Mr. E. T. Atkinson took it in the Rupin Pass, Spiti. In Mr. J. H. Leech’s Collection are specimens from Goorais Valley, Kashmir, taken in September; Kukti, 8,500 feet, in July; Dugi Pass, 12,000 feet, August and September, taken by Capt. Thompson. Mr. A. Grote possessed a specimen taken at Naini Tal.

**PIERIS HARRIETÆ** (Plate 524, figs. 2, 2a, ♂, 2b, ♀).

*Metaporia Harrietæ*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1892, p. 341, pl. I., figs. 3 ♂, 4 ♀;  
*id.* Sikkim Gazetteer, 1894, p. 168.

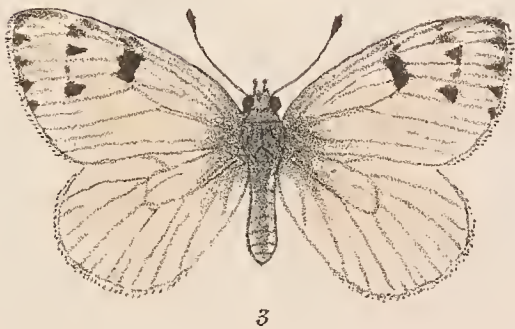
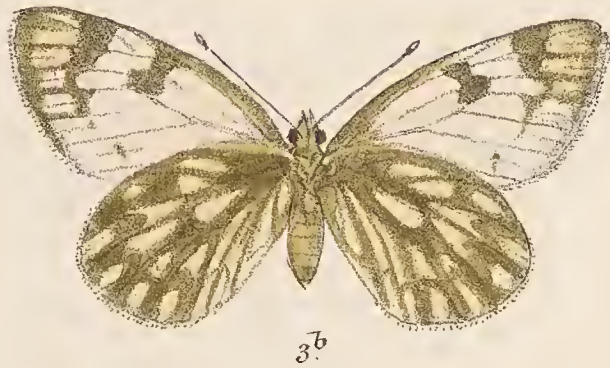
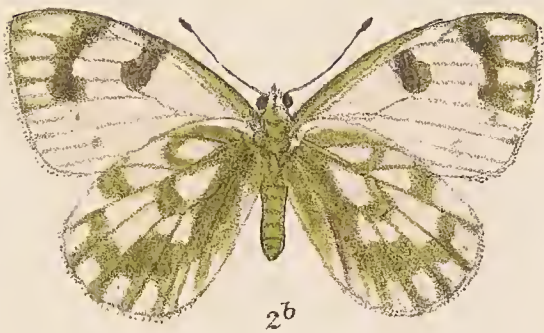
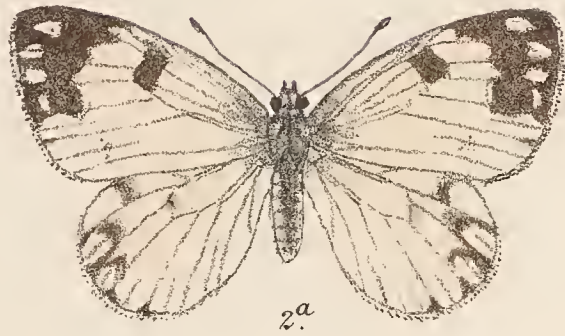
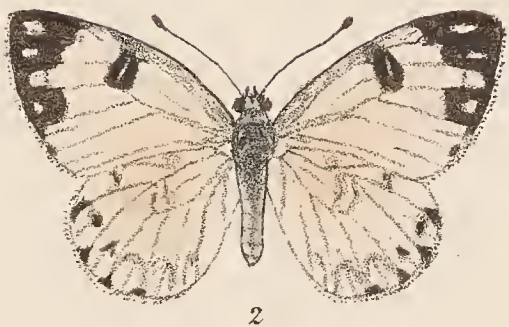
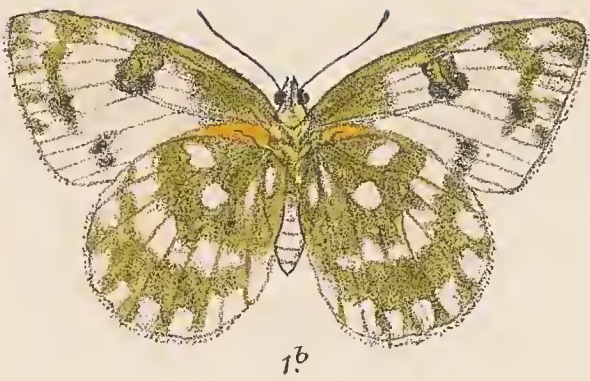
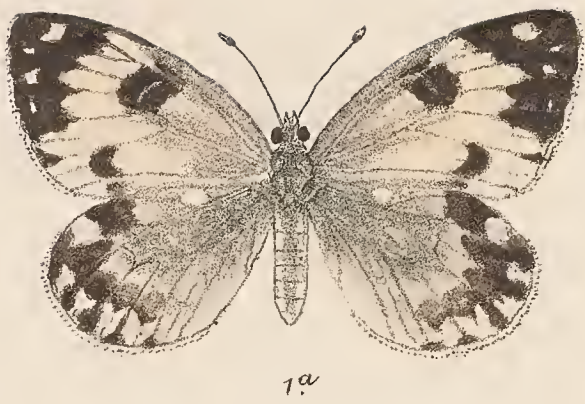
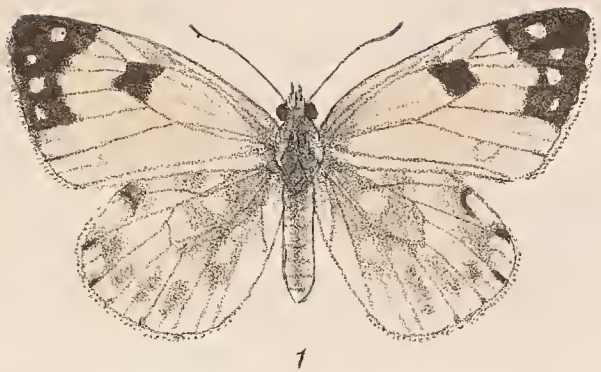
IMAGO.—Male. Upperside black. *Forewing* with a white slender streak at base of the costa, a creamy-white large broad streak occupying the basal three-fourths of the cell, its outer end being pointed, a discal transverse series of more or less oval spots, and a large elongated slightly-divided lower streak beneath the cell, followed by an outer marginal row of small whitish duplex-spots. *Hindwing* with a creamy-white basal costal streak, a streak almost filling the cell, a curved inner-discal series of small oval spots and slender elongated lower and abdominal-marginal streaks, and then an outer marginal row of small whitish duplex-spots. Underside duller black. *Forewing* with white markings as above, except that the marginal duplex-spots are more elongated. *Hindwing* with markings, as on upperside, tinted with pale yellow, the basal spot being chrome-yellow, the marginal duplex-spots all elongated and closely approximating to the discal spots.

Female. Upperside paler black than in the male. Both wings with similar markings, the marginal duplex-spots being more elongated. Underside similar to the male.

Expanse, ♂  $2\frac{3}{4}$ , ♀ 3 inches.

HABITAT.—Bhotan.





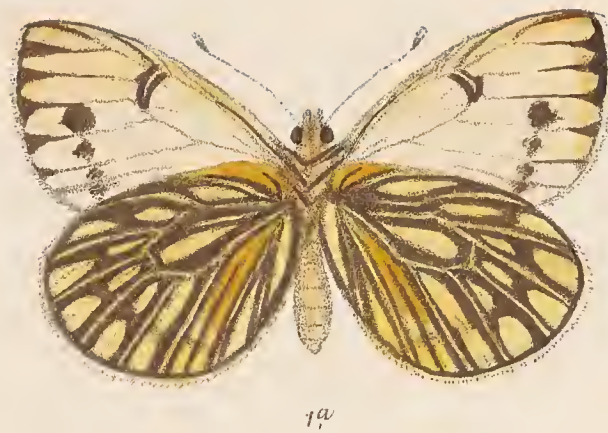
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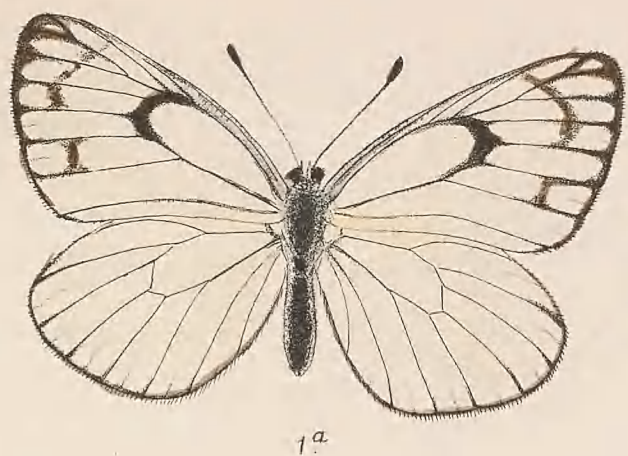
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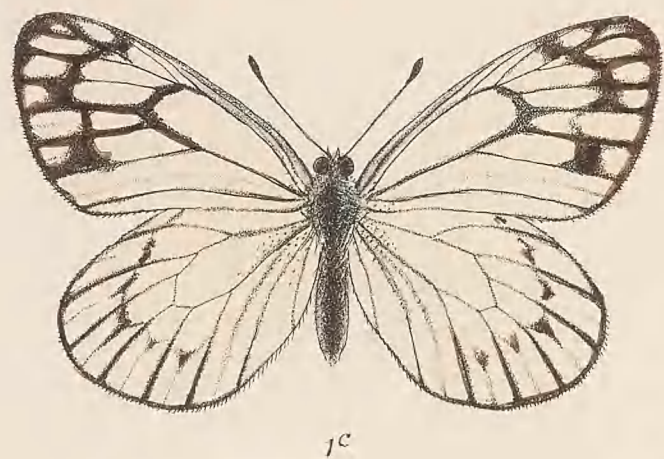




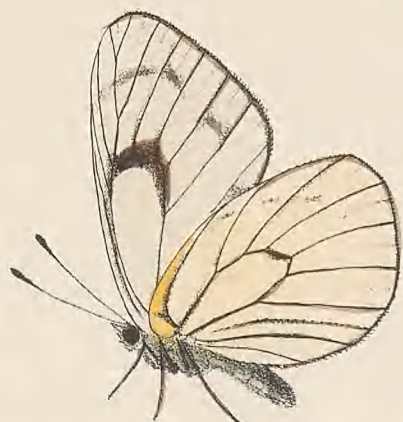




1<sup>a</sup>



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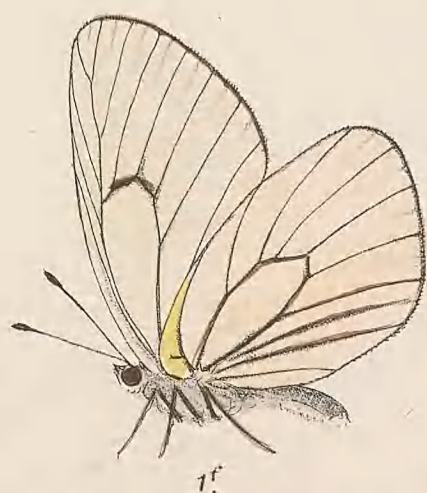
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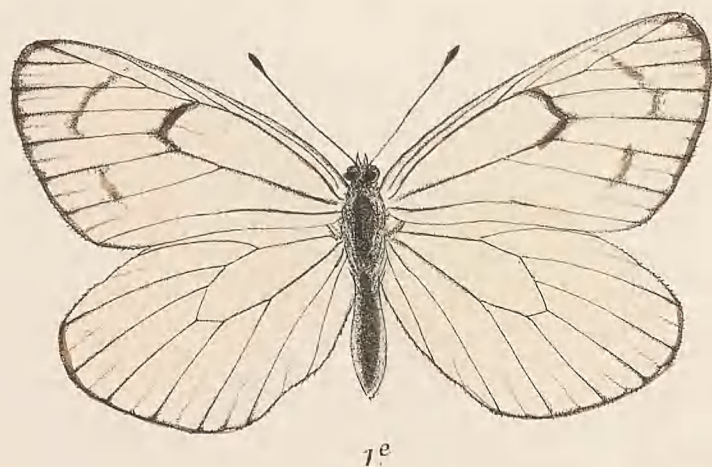
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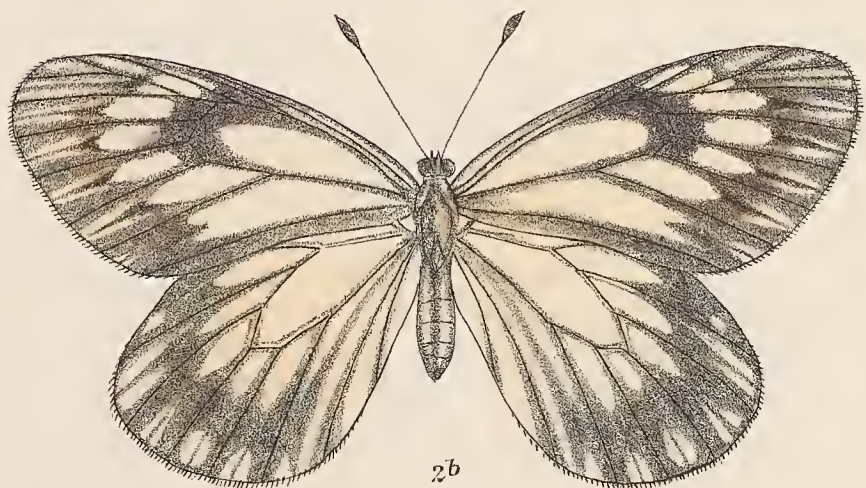
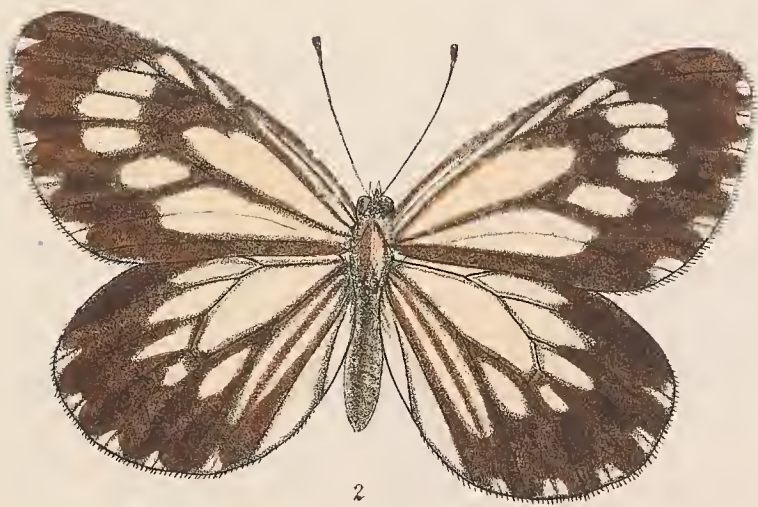
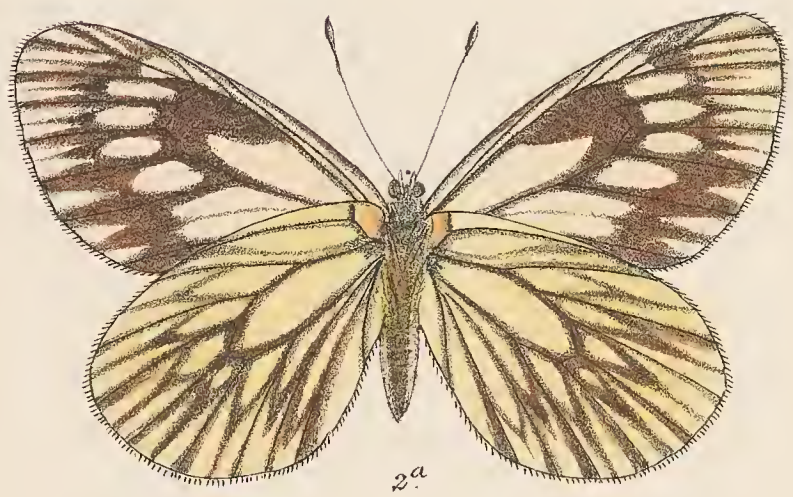
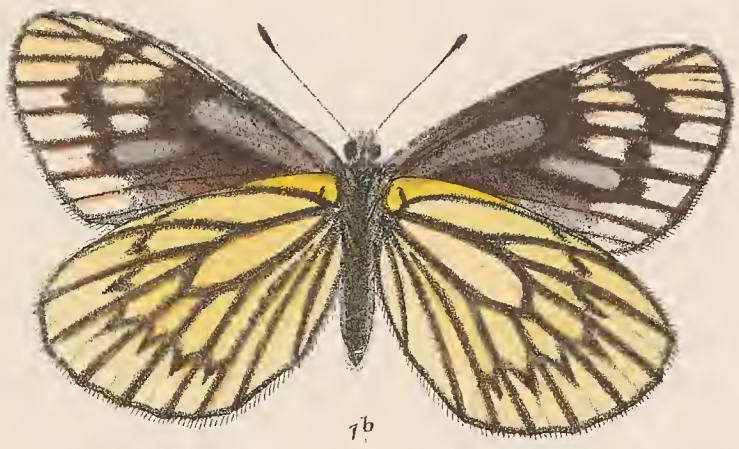
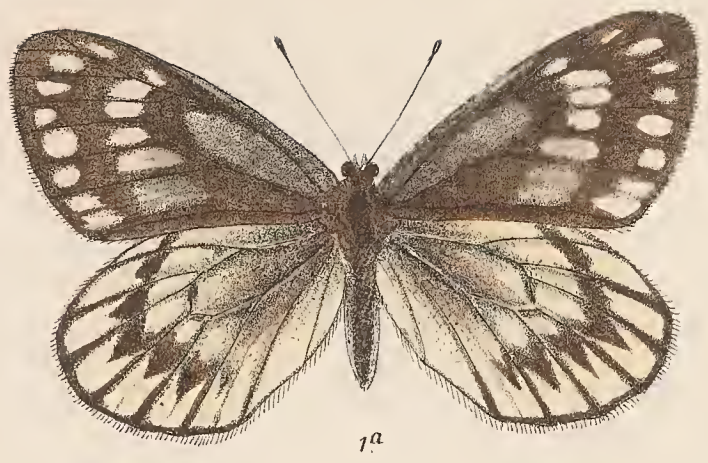


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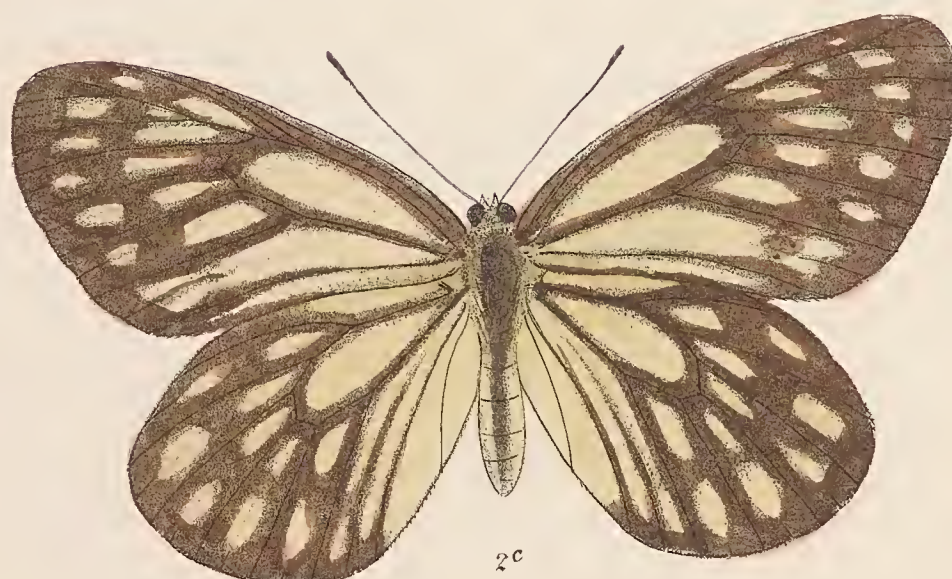
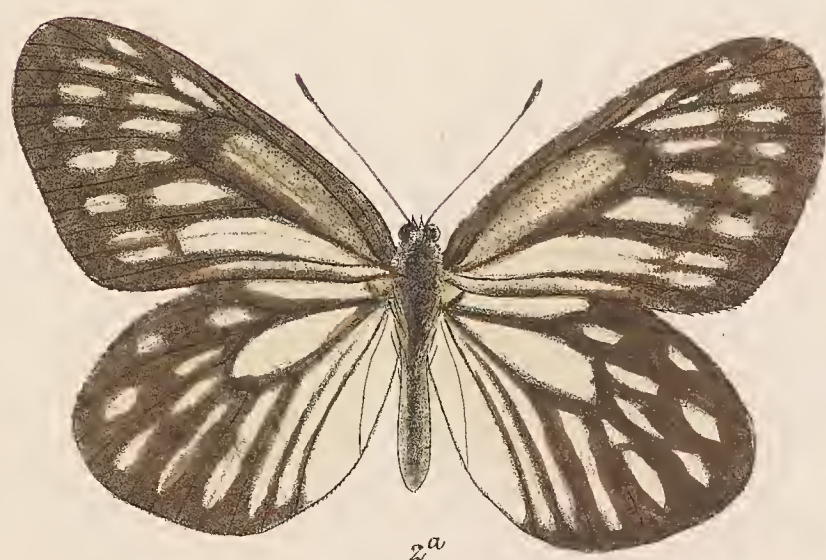
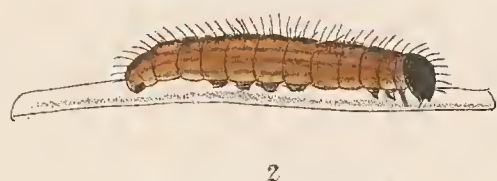












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1<sup>b</sup>



1<sup>a</sup>



2<sup>a</sup>



2



2<sup>b</sup>







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Described by Mr. L. de Nicéville, from a single pair obtained in Bhotan by Mr. F. A. Möller's native collectors.

CHINESE SPECIES.—*Pieris Cratægi* (Pap. Cratægi, Linnæus, Syst. Nat. x. ed. i. p. 467 (1758); *id.* Faun. Suec. p. 269 (1761); *id.* S. N. xii. ed. i. 2, p. 758 (1767). Esper, Schmett. i. p. 47, pl. 2, fig. 3 (1777). Heliconius Cratægi, Barbut, Gen. Ins. Linn. p. 169, pl. 10, fig. 70 (1781). *Pieris Cratægi*, Schrank, Fauna Boica, ii. 1, p. 164 (1801). Jermyn, Butt. Coll. Vade Mecum, pp. 43, 60 (1824). Stephens, Illust. Brit. Ent. Haust. i. p. 25 (1827). Menetries, Schrenck's Reis. Amur. ii. p. 16 (1859). Bremer, Lep. Ost-Siber. p. 7 (1864). *Aporia Cratægi*, Hübner, Verz. bek. Schmett. p. 90 (1816). Buckler, Larvæ of Brit. Butt. i. pl. 2, fig. 1a, b, c, larva and pupa (1866). Pryer, Rhop. Nipon, p. 5, pl. 3, fig. 7 (1886). Leech, Butt. of China and Japan, ii. p. 473 (1894). *Syn.* Pap. nigronervosus, Retz. Gen. Spec. Ins. p. 30 (1783). *Habitat.* Europe; Siberia; Amurland; Mongolia; China; Corea; Japan.—*Pieris Hippiæ*, Bremer, Bull. Acad. Petrop. iii. p. 464 (1861); *id.* Lep. Ost-Siber. p. 7, pl. 3, fig. 1 (1864). *Aporia Hippiæ*, Leech, *l.c.* p. 471. *Syn.* Leuconea Cratægoides, Lucas, Ann. Soc. Ent. Fr. 1866, p. 503, pl. xi., fig. 11. *Habitat.* Amurland; N. and W. China.—*Pieris Bietæ*, Oberthür, Etudes Ent. ix. p. 12, pl. 1, fig. 7, 8, ♂ ♀ (1884). *Aporia Bietæ*, Leech, Butt. of China, ii. p. 471, pl. 36, fig. 2 (1894). *Syn.* *Pieris sulphurea et fumosa*, Oberthür, *l.c.* *Habitat.* Amurland; Mongolia; N. and W. China.—*Pieris Martinetæ*, Oberthür, Etud. Ent. ix. p. 12, pl. 1, fig. 5 ♂ (1881); *id.* xiii. p. 38, pl. 9, fig. 98 ♀ (1890). *Aporia Martinetæ*, Leech, *l.c.* p. 470 (1894). *Syn.* *Pieris Kreitneræ*, Friv. Term. Fuz. x. p. 39, pl. 4, fig. 1, 2 (1886). *Habitat.* W. China; Yunnan.—*Pieris Potaninæ* (*Aporia Potaninæ*, Alpheraky, Rom. Mem. Lep. v. p. 96 (1889); Leech, *l.c.* p. 659. *Syn.* Ap. Martinetæ, Alph. *l.c.* pl. 5, fig. 1. *Habitat.* W. China.—*Pieris Delavayæ*, Oberthür, Etud. Ent. xiii. p. 37, pl. 9, fig. 97 (1890). *Metaporia Delavayæ*, Leech, *l.c.* p. 466. *Habitat.* W. China.—*Pieris Leucodice* (*Pontia Leucodice*, Eversmann, Bull. Mosc. 1843, p. 541, pl. 7, fig. 2, a, b). Herr. Schæff. Eur. Schmett. i. fig. 619-20 (1852). *Habitat.* Siberia; Amur.—*Pieris Procris* (*Aporia Procris*, Leech, Entom. 1890, p. 191; *id.* Butt. of China, ii. p. 469, pl. 33, fig. 10, ♂. *Syn.* *Pieris Halisca*, Oberthür, Et. Ent. xv. p. 7, pl. 3, fig. 23 (1891). *Habitat.* W. China.—*Pieris Lhamo*, Oberthür, Et. Ent. xviii. p. 13, pl. 2, fig. 27 (1893). *Aporia Lhamo*, Leech, *l.c.* p. 658. *Habitat.* E. Tibet.—*Pieris Goutellæ*, Oberthür, Et. Ent. xi. p. 15, pl. 2, fig. 11 (1886). *Metaporia Goutellæ*, Leech, *l.c.* p. 465. *Habitat.* W. China.

#### Genus METAPORIA.

*Metaporia*, Butler, Cistula Entom. i. pp. 38, 51 (1870); *id.* Proc. Zool. Soc. 1878, p. 61. Leech Butt. of China, ii. p. 460 (1894). Kirby, Allen's Nat. Libr. Butt. ii. p. 158 (1896).



IMAGO.—*Forewing* more elongated than in *Pieris Crataegi*, exterior margin more convex; first and second subcostal branches both emitted further from before the end of the cell, and the fourth branch much further from the apex below the third; cell broader. *Hindwing* more elongated apically; cell broader and less pointed at the end; lower discocellular less oblique. Palpi stouter, more densely hairy beneath; antennæ longer; abdomen compactly scaled.

TYPE.—*M. Agathon*.

HABITS OF LARVA.—According to the observations of Mr. P. W. Mackinnon, made in Masuri, the “larvæ of *M. Caphusa* are gregarious, spinning a joint feeble web, under which they lie in communities of ten or more. The pupa is also gregarious.”

MIMICRY.—*M. Caphusa*, *Ariaca*, and *Agathon* are fair mimics of the common Limnaine butterfly *Parantica melanoides*.

#### METAPORIA PHRYXE (Plate 525, fig. 1, 1a, ♂, 1b, ♀).

*Peris Phryxe*, Boisduval, Spec. Gén. Lep. i. p. 446 (1836). Blanchard, Jacquemont's Voy. Inde iv., Ins. p. 16, pl. 2. fig. 1 (1844).

*Metaporia Phryxe*, Butler, Proc. Zool. Soc. 1878, p. 61. Moore, P. Z. S., 1882, p. 256.

*Aporia Phryxe*, Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 589.

IMAGO.—Male. Upperside pale yellowish-white, veins black lined; cilia greyish-black. *Forewing* with a black slender costal edge, a broad discocellular patch at end of the cell, the black also bordering the outer veins and expanding in their middle, thence dilating at their marginal end. *Hindwing* with black-bordered veins, the black of the outer veins being medially expanded and then marginally dilated as on the forewing. Underside. *Forewing* white. *Hindwing* pale yellowish-white, with the base of costa chrome-yellow. Both wings with black vein-markings as on the upper-side. Body above black; thorax and head clothed with intermixed fine silky black and greyish hairs; legs black, femora and tibiæ white streaked; antennæ black.

Female. Upperside duller yellowish-white. Both wings with similar, but duller black and somewhat broader vein-markings than in the male. Underside with similar duller black markings as on the upperside, the ground-colour of the hindwings being also duller yellow tinted than in the male.

Expanse, ♂ 3 to  $3\frac{1}{4}$ , ♀  $3\frac{1}{4}$  to  $3\frac{1}{2}$  inches.

HABITAT.—W. Himalayas.

DISTRIBUTION.—Mr. P. W. Mackinnon records this as “somewhat rare in Masuri, much more so than *Caphusa*, but occurs at the same time—May and June” (J. Bombay N. H. Soc. 1898, 589). We possess both sexes from Simla, and a female from Kunawur, taken by Capt. A. M. Lang. In the British Museum collection are



specimens from Dalhousie, taken in June by Capt. Harford, and from Kulu by Capt. G. Young.

**METAPORIA CAPHUSA** (Plate 525, fig. 2, *larva* and *pupa*, 2a, b, ♂, 2c, ♀).

*Metaporia Caphusa*, Moore, Proc. Zool. Soc. Lond. 1872, p. 564, ♂ ♀ ; *id. l.c.* 1882, p. 256.

*Aporia Caphusa*, Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 589, pl. v. fig. 20, a, b, c, *larva* and *pupa*.

*Aporia Agathon*, Lang, Ent. Mo. Mag. 1864, p. 102. Moore, P. Z. S. 1865, p. 489.

IMAGO.—Male. Upperside browish-black. *Forewing* with a greyish-white speckled broad elongated cell-streak, a discal and a submarginal transverse series of greyish-white short narrow streaks, the three lowest pair each being indistinctly coalescent, and the lowest of the discal series broad and elongated ; below the latter is also a slender posterior marginal streak. *Hindwing* with a greyish-white basal costal spot, a broad costal streak, a broad cell streak, and a discal and submarginal series of short narrow pointed-streaks, the three or four lowest pairs each being slightly coalescent ; the abdominal margin also broadly white. Underside duller black. *Forewing* with markings as above, but whiter. *Hindwing* with markings as above, but of a pale yellowish tint, except the basal spot, which is chrome yellow ; the discal and submarginal series not being coalesced posteriorly.

Female. Upperside dull black ; the markings on both wings pale yellowish-white, as in the male ; the cell streak on the forewing being also prominent. Underside similar to the male, except that the markings of the hindwing are of a darker yellow tint.

Expanse, ♂  $2\frac{6}{10}$  to 3, ♀ 3 to  $3\frac{4}{10}$  inches.

LARVA AND PUPA.—“ Resembles that of *A. Soracta*. It is dichroic, one form is reddish-brown, the other is green. Our figure 20b was drawn from a specimen preserved in glycerine, which had greatly shrunk, it should have been as long and slender as fig. 20a. The larvæ feed on *Berberis nepalensis* ; they are gregarious, and spin a joint feeble web, and lie together in communities of ten or more. They feed at night only. When full-grown the colour is dirty-brown, head black, each segment with a dorsal longitudinal dark brown stripe ; the larva is thinly covered with weak white hairs. Just before pupation the colour turns to a light green, with the head and stripes as before ; and to pupate burrow under the leaves at the foot of their food-plant. The pupa is also gregarious ” (P. W. Mackinnon, *l.c.* 589).

HABITAT.—W. Himalayas.

DISTRIBUTION.—Capt. A. M. Lang says “ this is a mountain-insect, frequenting forests and shady glens. At Simla I saw it in considerable numbers in June. Its flight much resembles that of *Danais Chrysippus*, and it is of easy capture. It appears local, as I have seen it only at Simla, and in some richly-wooded glens



upwards of 100 miles in the interior of the Himalayas" (Ent. Mo. Mag. 1864, 102). We possess both sexes from Masuri, 7,000 feet altitude, and a female from Kunawur, taken by Capt. Lang.

Mr. L. de Nicéville remarks (Journ. As. Soc. Bengal, 1883, p. 65) that "when capturing the Nymphaline butterfly *Hestina Zella* [=Nicévillei, Moore] it at once struck me that it was an excellent mimic, both in the slow and sailing mode of its flight, and in general appearance, of *Metaporia Caphusa*, which is an exceedingly common Pierine butterfly in the spring in many parts of the Outer N.W. Himalayas, and which latter is, doubtless, a protected species." Mr. P. W. Mackinnon records this butterfly as "occurring at Masuri in enormous numbers, during May and June, on the tops of the Hills and in shady ravines" (J. Bombay N. H. Soc. 1898, 589).

**METAPORIA ARIACA** (Plate 526, fig. 1, 1a, ♂, 1b, ♀).

*Metaporia Ariaca*, Moore, Proc. Zool. Soc. Lond. 1872, p. 564, ♂.

*Aporia Agathon*, Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 590.

IMAGO.—Male. Upperside. Differs from *M. Caphusa* in the ground-colour being blacker. *Forewing* with the dusky cell-streak broader, the discal and submarginal white streaks narrower and smaller, sharply defined and more prominent, and with a wider transverse interspace between the two series; the lower discal streak traversed by a black-scaled line, and the posterior marginal streak is absent. *Hindwing* also with the discal and submarginal white streaks narrower and shorter, the two series being also widely separated. Underside also differs from *Caphusa*, as on the upper-side, in the widely separated discal and submarginal streaks.

Female. Upperside duller black than in the male. Both wings with the discal and submarginal streaks also widely separated.

Expanse, ♂ 3 to  $3\frac{1}{4}$ , ♀  $3\frac{1}{2}$  inches.

HABITAT.—Western Himalayas.

DISTRIBUTION.—We possess specimens of both sexes of this butterfly from the Western Himalayas, and a female from Naini Tal, Kumaon. In the British Museum collection is a specimen from Runeket, Kumaon.

**METAPORIA AGATHON** (Plate 526, fig. 2, 2a, ♂, 2b, ♀).

*Pieris Agathon*, Gray, Zool. Misc. p. 33 (1832); *id.* Lep. Ins. Nepal, p. 8, pl. 8, fig. 1 (1846). Boisduval, Spec. Gén. Lep. i. p. 447 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 48 (1846).

Moore, Catal. Lep. Mus. E. I. Company, i. p. 83 (1857).

*Metaporia Agathon*, Butler, Cistula Entom. i. p. 51, pl. 3, fig. 10, *id.* Proc. Zool. Soc. 1878, p. 61. Swinhoe, Trans. Ent. Soc. 1893, p. 309. de Nicéville, Sikkim Gaz. 1894, p. 168. Kirby, Allen's Nat. Libr. Butt. ii. p. 128 (1896).

*Pieris (Aporia) Agathon*, Elwes, Trans. Ent. Soc. 1888, p. 415.



IMAGO.—Male. Upperside deep black. *Forewing* with a greyish-white scaled elongated narrow cell streak, and two similar-scaled basally-united slender streaks below the cell; a transverse discal and a submarginal series of slender short white streaks. *Hindwing* with a white basal spot, a narrow elongated costal streak, a broad cell streak medially traversed by a slight blackish line, a discal series of small slender short streaks, and a submarginal series of more oval-shaped short streaks; the abdominal border also being white. Underside, purpurescent browish-black. *Forewing* with all the markings, as above, prominently white. *Hindwing* with all the markings, as above, tinted with olivescient-yellow, the basal spot being chrome-yellow. *Body* above, legs, and antennæ black; thorax above clothed with long silky grey hairs; thorax, collar, palpi, and legs beneath, white streaked.

Female. Upperside duller black, with similar markings. Underside also with similar markings, those on the hindwing and the apical on the forewing of a darker tint of yellow.

Expanse, ♂  $3\frac{1}{4}$  to 4, ♀  $3\frac{3}{4}$  inches.

HABITAT.—Eastern Himalayas; Khasia and Naga Hills.

DISTRIBUTION.—We possess specimens of both sexes from Nepal, taken by the late General G. Ramsay. Specimens are recorded from "Bhotan, taken by Major R. B. Pemberton during the Mission in 1837-8" (Catal. Lep. E. I. C. i. p. 83). Mr. H. J. Elwes records "a single specimen of this species was brought by my native collectors from the interior towards Bhotan in 1883, but it has not been obtained certainly in Sikkim" (Tr. Ent. Soc. 1888, 415). Mr. L. de Nicéville says "Mr. Möller received a single male from his native collectors, probably from the same locality" (Sikk. Gaz. 1894, 168). Col. C. Swinhoe records it as "very common in the Khasia Hills" (Tr. Ent. Soc. 1893, 309). In the collection of the late Mr. W. S. Atkinson were specimens from the Naga Hills.

CHINESE SPECIES.—*Metaporia Largebeauui* (Pieris Largebeauui, Oberthür, Etudes Ent. vi. p. 12, pl. 7, fig. 1 (1881). Leech, Butt. of China, ii. p. 461, pl. 36, fig. 9, ♀ (1894). *Habitat.* W. and C. China.—*Metaporia Oberthüri* (Pieris Oberthüri, Leech, Entom. 1890, p. 46. Oberth. Etud. Ent. xvi. p. 5, pl. 1, fig. 2 (1892). Leech, Butt. of China, ii. p. 462, pl. 36, fig. 7, ♂. *Habitat.* C. China.—*Metaporia Hastata* (Pieris Hastata, Oberthür, Et. Ent. xvi. p. 5, pl. 1, fig. 6 (1892). *Habitat.* Yunnan.—*Metaporia Paracræa*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1900, p. 171, pl. EE, fig 19, ♂. *Habitat.* W. China.—*Metaporia Larraldei* (Pieris Larraldei Oberthür, Et. Ent. ii. p. 19, pl. 1, fig. 2 a, b (1876). Leech, *l.c.* ii. p. 464. *Syn.* P. Melania, Oberth. *l.c.* xvi. p. 5, pl. 1, fig. 5 (1892); P. Nutans, Oberth. *id.* p. 6, pl. 1, fig. 3. *Habitat.* C. China; Yunnan.—*Metaporia Lotis* (Pieris Lotis, Leech, Entom. 1890, p. 192); Butt. of China, ii. p. 463, pl. 36, fig. 6, ♂ (1894). *Habitat.* C. China.—



*Metaporia Acræa* (Pieris Acræa, Oberthür, Bull. Soc. Ent. Fr. 1885, p. 226. *id.* Etud. Ent. xi. pl. 2, fig. 7). Leech, *l.c.* ii. p. 453. *Habitat.* W. China.

### Genus ANAPHÆIS.

*Anaphæis*, Hübner, Verz. bek. Schmett. p. 93 (1816).

*Pinacopteryx* (Sect. 1), Wallengren, Rhop. Caffr. p. 7 (K. Svenka Vet. Akad. Handl. 1857) *id.* 1858. p. 75.

*Belenois*, Moore, Lep. of Ceylon, i. p. 137 (1881).—*Nec* Hübner.

IMAGO.—Male. *Forewing* triangular; costal edge smooth (not serrated as in type of *Belenois*) exterior margin slightly uneven; costal vein extending to two-thirds the margin; subcostal vein four branched, first subcostal branch emitted at about one-fourth before end of the cell and partly anastomosed to the costal vein at some distance before its end, second branch at one-eighth before end of the cell, third bifid, the upper discocellular being emitted at one-third beyond the cell; discocellulars oblique, upper shortest and slightly incurved, lower radial from their angle; middle median at two-fifths, and lower at one-fifth before end of the cell; submedian vein slightly recurved. *Hindwing* broadly oval; exterior margin slightly scalloped; precostal vein short, curved, emitted at some distance beyond base of costal vein; first subcostal branch at more than half before upper end of the cell; upper discocellular very oblique, shortest, lower less oblique; cell fusiform; middle median at one-fifth and lower at nearly one-half before end of the cell; submedian long, straight; internal vein slightly recurved. *Body* moderate; thorax clothed with fine silky hairs; abdomen compactly scaled; palpi long, very laxly hairy beneath, second joint extending beyond the eyes, third joint long and slender; antennæ with a lengthened spatulate club.

TYPE.—A. Creona.

**ANAPHÆIS MESENTINA** (Plate 527, fig. 1, *larva* and *pupa*; 1a, b, c, ♂, 1d, ♀; 1e, ♂, 1f, g, h, ♀).

*Papilio Mesentina*, Cramer, Pap. Exot. iii. pl. 270, fig. A, B (1782).

*Pieris Mesentina*, Godart, Encyc. Méth. ix. p. 130 (1819). Boisduval, Spec. Gén. Lep. i. p. 501 (1836).

Kollar, in Hügel's Kaschmir, iv. 2, p. 409 (1844). Doubleday and Hewitson, Gen. D. Lep. i. p. 46 (1847). Moore, Catal. Lep. Mus. E. I. C. i. p. 72, pl. 12, fig. 9, 9a, *larva* and *pupa* (1857). Lang, Ent. Mo. Mag. 1864, p. 102; Chaumette, *id. l.c.* 1865, p. 37. Moore, P. Z. S. 1865, p. 489. *id.* 1882, p. 255. Butler, Catal. Fabr. Lep. B. M. p. 204 (1869). Bienert, Lep. Ergeb. Reise Persien, p. 26 (1869-70). Swinhoe, P. Z. S. 1884, p. 511; *id.* Tr. Ent. Soc. 1885, p. 343. Elwes, Trans. Ent. Soc. 1888, p. 417.

*Pontia Mesentina*, Horsfield, Catal. Lep. Mus. E. I. C. p. 142 (1829).

*Belenois Mesentina*, Butler, Ann. Nat. Hist. 1880, p. 223; *id.* 1882, p. 4; *id.* Proc. Zool. Soc. 1880, p. 409, pl. 39, fig. 6, *pupa*. de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51. Swinhoe, P. Z. S.



1885, p. 136; *id.* 1886, p. 430. Hampson, Journ. As. Soc. Beng. 1888, p. 363. Ferguson, Journ. As. Soc. Beng. 1891, p. 444. de Nicéville, Sikkim Gaz. 1894, p. 168. de Nicéville and Aitken, Journ. As. Soc. Beng. 1896, p. 575. Mackinnon, Journ. Bombay Nat. Hist. Soc. 1898, p. 590. Watson, Journ. Bombay, N. H. Soc. 1898, p. 8.

*Papilio Aurota*, Fabricius, Ent. Syst. iii. 1, p. 197 (1793).

*Pieris Lordaca*, Walker, Entomologist, v. p. 48 (1870).—*Dry form.*

*Belenois Lordaca*, Butler, Proc. Zool. Soc. 1886, p. 375.

*Belenois Aurigena*, Butler, Proc. Zool. Soc. 1886, p. 374, ♀; *id.* Ann. Nat. Hist. 1888, p. 203.—*Wet form.*

IMAGO.—Male. Upperside greyish white. *Forewing* with a black excurved bar at end of the cell, which extends slenderly from base of first subcostal branch and then widens outward to the upper median veinlet; beyond is a broad apical marginal band enclosing six white spots, the three upper being somewhat elongated, the lower short and small, the inner-edge of the band is sinuous. *Hindwing* with either a more or less ill-defined, or a prominent-black outer-marginal band enclosing a series of four rounded white spots; in some specimens a slightly-defined black-scaled costal spot and a slender streak on middle of the discocellular is present, and the dark vein-borders of the underside indicated. Underside. *Forewing* with black markings as on upperside, the black extending to base of the subcostal, and in some specimens the series of apical spots are more or less tinted with yellow. *Hindwing* with the veins more or less slightly, or prominently, black bordered, the marginal spotted border complete, and all the interspaces of the wing are either white or tinted with pale or dark ochreous-yellow.

Female. Upperside. *Forewing* with the cell bar broader than in male and extending inward to near base of the costa; the apical marginal band also broader, with its enclosed spots smaller and either less prominent, or indistinctly defined. *Hindwing* either with slightly-defined or prominent markings, as in the male, or with the veins more or less indistinctly black lined and the spots of the marginal band indistinct or partly obsolescent. Underside. *Forewing* with the base yellow-tinted, a broader cell-bar and outer band, the enclosed spots of the latter being more or less yellow tinted. *Hindwing* with all the veins black bordered, and the discal interspaces only are white or all are uniformly tinted with pale or dark ochreous-yellow. *Body*, palpi, and legs greyish-white; antennæ black above, whitish annulated beneath.

Expanse, ♂ ♀  $1\frac{3}{4}$  to  $2\frac{1}{2}$  inches.

HABITAT.—E. Africa; E. Arabia; Persia; Beluchistan; Afghanistan; W. and E. Himalayas; Continental India.

LIFE HISTORY.—EGG.—“Half a line long, semi-conical, bright yellow. About twenty-five in number, very close to each other, but not touching, placed on the upper surface of the leaf.”

LARVA.—“When hatched, a line long, olive colour, with a distinct glossy jet-



black head. *After first moult*.—One-fourth inch long; grass green; dorsal line very distinct, dark green; lateral line very broad, plum colour and mottled, dentated into the ground-colour on the last two segments on its upperside; a small white spot on either side of dorsal line on each segment; a yellow spot on each segment on the lateral line on either side; abdomen glossy green; ventral line distinct, rather interrupted, grass green; all the legs green, hairy; head shiny-black, with a green triangular mark in front, covered with stiff whitish hairs; stigmata dark coloured; sides greyish-green, slightly wrinkled transversely; the portion of ground-colour between lateral and dorsal line slightly powdered with yellow; hair whitish-grey; anal segment black and hairy; first segment rather swollen in front. *After last moult*.—Length one and a quarter inch long; cylindrical, broader towards the head, slightly tomentose on back, hairy on the sides; otherwise as after first moult. Habits not lively. *Food Plant*.—Feeds on the Pea-leaved Caper (*Capparis pycifolia*). Changed to chrysalis April 1st, 1861."

PUPA.—"Succincta; five-eighths inch long, transparent pale cream colour. In front a longish tubercle directed forwards, with a black mark on each side, and a smaller one on either side of fourth segment, perfectly black; a lateral line of pale plum colour, on which is a longitudinal row of yellow round dots, one on each segment, and a transverse row of dots on each segment; dashed and marked with black, particularly on the abdomen. After the escape of the imago, the fifth and sixth segment of the pupa becomes blood red."

IMAGO.—"Emergèd on April 7th, 1861."

*Habits of Imago*.—"Fond of woods, where it flies about pretty dodgingly, then settles for a moment, and off again. Common at Lucknow from January onwards" (Capt. H. L. Chaumette MS. Notes).

According to the observations of Messrs. Davidson and Aitken (Journ. Bombay N. H. Soc. 1896, 575) "the larvæ are gregarious throughout their existence, the eggs being laid in batches of from 10 to 40."

DISTRIBUTION (Within our Area).—Col. C. Swinhoe records "a pair taken at Much in the Bolan Pass, Beluchistan, in October, 1879" (Ann. N. H. 1880, 223), and found it "occurring very commonly in Quetta, N. Beluchistan, from February to May, and in November and December" (P. Z. S. 1881, 611). Col. Swinhoe also took it at "Chaman in March; in Quetta, March to May, and in September; Ispingil in June; Karain in June; Kandahar in April, June, October, and November. Very common" (Tr. Ent. Soc. 1885, 136). Capt. H. B. Hellard obtained it at "Rawul Pindi, Allahabad, Simla, and Kasauli" (MS. Notes). The type specimen of *aurigena*, Butler, a female, was taken by Col. J. W. Yerbury at "Campbellpur at the end of May" (P. Z. S. 1886, 375). The male of the pale form (*Lordaca*) was also taken at Campbellpur on June 11th, and females at Chittar Pahar, 2,000 to 3,000 feet elevation,



in November. Col. Yerbury records it as common in May, June, and July, and again in October and November, a few being seen also in December. The spring brood is much the darkest. The caterpillar feeds on *Capparis* (? *C. horrida*)" (P. Z. S. 1886, 375). Mr. P. W. Mackinnon found it "rare in Masuri in May; taken on the Nag Tiba at 10,000 feet elevation in November. It is very common throughout the warmer months and the autumn in Dehra Dun" (J. Bombay N. H. Soc. 1898, 590). Mr. W. Doherty took it at "Ranebagh, 1,000 feet altitude, in Kumaon" (J. As. Soc. Beng. 1886, 135). Capt. A. M. Lang obtained it at "Wangtoo, N. W. Himalaya, on the road to the Chinese frontier village of Shipkee" (MS. Notes). Capt. Lang also records it from "Kasauli, 6,000 feet elevation, on the first plainwards range of the Himalayas" (P. Z. S. 1865, 489), and in his MS. Notes says "abundant in Oudh and at Umballa, in the Plains, the larva feeding on *Capparis sepiaria*." Capt. H. L. Chaumette took it at "Lucknow in January, and reared it from the egg, the larva feeding on *Capparis pycifolia*" (MS. Notes). Col. C. Swinhoe records "the pale form, as appearing plentifully in Kurrachi, from February to May" (P. Z. S. 1884, 511); also that it is "common at Mhow, in Central India, all the year round" (P. Z. S. 1886, 430), and "common everywhere in Bombay and the Dekkan" (P. Z. S. 1885, 136). Messrs. Davidson and Aitken say "this butterfly is not common in Kanara generally, but we have met with it at the northern end of the coast, on the borders of the Portuguese territory (in which it is plentiful), and also on one of those rocky islands not far from the shore. The larva feeds on the Caper (*Capparis divaricata*), and in the form of the larva and pupa shows a decided approximation to those of *Delias Eucharis*. The larva is cylindrical and sparingly clothed with long white hairs springing from small tubercles, its colour is yellow-ochre and purplish-brown. The pupa is green and yellow. The larvæ are gregarious throughout their existence, the eggs being laid in batches of from ten to forty" (J. Bombay N. H. Soc. 1896, 575). Mr. G. F. Hampson obtained it in the Nilgiris, at "1,000 to 8,000 feet elevation; *aurigena* being the wet-season form, and *Lordaca* the dry-season form from dry localities and high elevations" (J. As. Soc. Beng. 1888, 363). Mr. H. S. Ferguson records it as "not common in Travancore, from 2,000 to 4,000 feet elevation" (J. Bombay N. H. Soc. 1891, 444). Capt. E. Y. Watson obtained it in "Madras, from March to August. Very common" (J. As. Soc. Bengal, 1890, 268), "and obtained numerous specimens at Nittur, in Mysore" (J. Bombay N. H. Soc. 1890, 8). Mr. W. S. Taylor found it "common at Khorda, in Orissa, Lower Bengal" (List 15). Mr. L. de Nicéville records it "common in the neighbourhood of Calcutta, the larva feeding on *Capparis horrida*" (J. As. Soc. Beng. 1885, 51). Mr. H. J. Elwes writes, it is "not common in the inner hills of Sikkim, but I have taken it in tea gardens about 3,000 feet, in July, and it occurs from April to October" (Tr. Ent. Soc. 1888, 417). Mr. G. C. Dudgeon obtained it in Bhotan.



In the British Museum Collection are specimens from Durbunga and Maunbhoom, Bengal, and in Mr. J. H. Leech's Collection from Sultanpur, Kulu, taken by Capt. G. Young, from Narkunda, and Kujiar, 6,000 feet, N.W. Himalaya, taken in April by Capt. McArthur.

Of our illustrations on Plate 527, fig. 1, *larva* and *pupa*, are from Mr. A. Grote's original drawing made in Calcutta; fig. 1, a, b, c, ♂, 1d, ♀, of *dry-season* form, and fig. 1e, ♂, f, g, h, ♀, of *wet-season* form.

**ANAPHÆIS TAPROBANA** (Plate 527, fig. 2, 2a, ♂, 2b, c, ♀).

*Pieris Taprobana*, Moore, Proc. Zool. Soc. Lond. 1872, p. 565.

*Belenois Taprobana*, Moore, Lep. of Ceylon, i. p. 137, pl. 53, fig. 3, 3a, b, ♂ ♀ (1881).

*Belenois Mesentina*, de Nicéville, Journ. As. Soc. Bengal, 1899, p. 216.

*Belenois Mesentina* subsp. *fervidior*, Fruhstorfer, Berl. Ent. Zeit. 1897, p. 326.

IMAGO.—Male. Upperside greyish-white. *Forewing* with a broader black outer marginal band than in Continental Indian examples of *A. Mesentina*; this band extends to the posterior angle, the three, or four, subapical enclosed white spots are very small and slender. *Hindwing* with a broad black marginal band traversed by very small slender white spots; the black costal spot and lunule beneath being prominent. Underside. *Forewing* with the base ochreous tinted, the broad marginal band, as above, the subapical spots small and ochreous tinted. *Hindwing* with the vein-borders and outer band dark vinous-brown, their interspaces and the small marginal spots being bright ochreous.

Female. Upperside of both wings basally suffused with pale ochreous, the marginal black bands somewhat broader, and without any traversing white spots. Underside similar to the male.

Expanse, 2 to  $2\frac{1}{4}$  inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Mr. F. M. Mackwood records it as inhabiting the low country, appearing, apparently, in certain years only, as, for two or three years together, scarcely one is to be seen, and then in the next year they appear in great numbers. Capt. Hutchison obtained it in gardens and open cultivated ground about Colombo, from October to end of the year. Its flight is slow, settling on the ground. It is very uncertain in its appearance; only observed during two out of five years' collection. Capt. Wade found it in Colombo, Hambantotte, and Galle (Lep. Ceylon, i. 137). Dr. N. Manders states that "it is uncertain in its appearance, but is abundant in the low country when it does occur, and then joins in the migratory flights, in June and July, and again in November and December" (Journ. As. Soc. Bengal, 1899, 216).



MALAY SPECIES.—*Anaphæis Java* (Pap. Java, Sparrm. Amœn. Acad. vii. p. 504 (1767). Linn. S. N. iii. App. Anim. p. 225 (1768). Belenois Java, Fruhst. Berl. Ent. Zeit. 1903, p. 108. *Syn.* Pap. Coronea, Cramer, Pap. Exot. i. pl. 68, fig. B, C (1779); *id.* iv. pl. 361, fig. G, H (1782). *Habitat.* Java.

### Genus DELIAS.

*Delias*, Hübner, Verz. bek. Schmett. p. 91 (1816). Butler, Cistula Entom. i. p. 40 (1870). Moore, Lep. Ceylon, i. p. 139 (1881). Distant, Rhop. Malay, p. 289 (1885). Schatz, Exot. Schmett. ii. p. 63 (1886). Mitis, Iris, vi. p. 97 (1893). Kirby, Allen's Nat. Libr. Butt. ii. p. 165 (1896). Grote, Proc. Amer. Phil. Soc. 1900, p. 33.

*Pieris* (sect. i. pt.), Doubleday and Hewitson, Gen. D. Lep. i. p. 44 (1847).

*Thyca* (sect. i. pt.), Wallengren, K. Vet. Akad. Förh. xv. p. 76 (1858).

*Thyca* (pt.), Wallace, Trans. Ent. Soc. Lond. 1867, p. 344.

IMAGO.—Wings large. *Forewing* elongated, triangular, narrow; apex rounded, exterior margin very oblique; costal vein extending to more than two-thirds the margin; subcostal vein three-branched, the first branch emitted at one-fifth before end of the cell, second bifid, the third being thrown off from the second at fully one-fourth from the apex, and the upper radial at about one-fifth beyond end of the cell; cell extending to more than half-length of the wing, very broad; discocellulars both slightly concave and oblique, lower radial from their angle; middle median at one-third and lower beyond half before end of cell; submedian recurved. *Hind-wing* oval, somewhat lengthened; precostal vein straight, curved outward at tip; costal vein much arched; first subcostal branch emitted at one-third before end of the cell; discocellulars very oblique, slightly concave, radial from their angle; cell very long, lower part extending two-thirds the wing; middle median at one-fifth and lower at nearly half before end of the cell; submedian straight, internal vein curved. *Body* moderately stout, abdomen compactly scaled, slightly hairy dorsally; thorax and head hairy; palpi extending beyond the front, very laxly hairy beneath, third joint long, slender; legs long, slender; antennæ with a stout grooved-club.

TYPE.—D. Egialea.

MIMICS.—The species of the Elymniine genus *Mimadelias* (Lep. Ind. ii. pp. 165-8, pl. 142-3) are excellent mimics of certain species of *Delias* and also of *Piccarda*.

### DELIAS SANACA (Plate 528, fig. 1, 1a, b, ♂, 1c, d, e, ♀).

*Pieris Sanaca*, Moore, Proc. Zool. Soc. Lond. 1857, p. 103, pl. 44, fig. 4 (err. 6), ♀; *id.* Catal. Lep. Mus. E. I. Company, i. p. 79 (1857). Lang, Ent. Mo. Mag. 1864, p. 102. Moore, Proc. Zool. Soc. 1865, p. 491.



*Delias Sanaca*, Moore, Proc. Zool. Soc. 1882, p. 256. de Nicéville, Trans. Ent. Soc. 1889, p. 343.  
Elwes, Ann. Nat. Hist. 1886, p. 159. Mitis, Iris, vi. p. 133 (1893).

*Delias flavalba*, Marshall, Proc. Zool. Soc. 1882, p. 759.

*Delias Belladonna* (pt.), Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 585.

IMAGO.—Male. Upperside greyish-white. *Forewing* with the costa, discocellulars, median branches, and outer margin slightly bordered with blackish scales, or all the veins and veinlets from their base; the discocellulars and the outer margin more broadly black bordered (varying to still greater width in certain specimens, and in which the ground-colour should be termed greyish-black and the markings white), thus leaving a whitish broad cell area, a discal transverse series of narrow elongated streaks and an outer marginal row of small lanceolate marks, the two latter series being more or less perceptibly coalescent. *Hindwing* with the subcostals and median slenderly black lined, and their outer marginal ends more broadly dilated with black scales; and a slightly-defined similar scaled subapical streak, or, the subcostals, the median and its branches basally, are broadly black scaled, thus broadly enclosing the white central area of the cell; beyond is a more or less slightly-defined submarginal blackish-scaled diffused narrow lunular line extending from near the apex to lower median, and a slender marginal line, thus enclosing a more or less apparent row of extreme-marginal whitish broad conical spots; these spots are quite differently placed, on both the upper and underside, to those in *D. Horsfieldii* and *Belladonna*,—in these two latter species their position is submarginal, the entire series being disposed inwardly and at some distance away from the extreme outer margin; base of costa chrome-yellow, and anal area broadly diffused with paler yellow. Underside greyish-white. Both wings with similarly disposed blackish markings, those on the hindwing being vinaceous-black. *Hindwing* with the cell area, costal, discal, and marginal white interspaces, each centrally clouded with yellow. *Body* above blackish scaled; abdomen beneath greyish-white; thorax beneath, palpi, antennæ, and legs black; femora and tibiæ slenderly white streaked.

Female. Upperside. Both wings with broader and more prominently black markings than in the darkest male, the white interspaces being thus more restricted and sharply defined, the yellow of the anal area on the hindwing is also paler and more diffused. Underside similar to the male, the dark portions of the hindwing more vinaceous-black.

Expanse, ♂ ♀.  $3\frac{1}{4}$  to  $3\frac{3}{4}$  inches.

HABITAT.—W. Himalayas.

DISTRIBUTION.—Capt. A. M. Lang records this butterfly as “very rare. Obtained only in one richly-wooded glen near Dharin, far in the interior of the



Western Himalayas. There it flew very strongly and fast, now under the Horse-Chestnut trees, now in the sunlight over the rocky bed of the stream. I caught one or two in June, resting or fluttering over the margins of the stream" (MS. Notes, 1864). "There seems to be two forms of *Sanaca*, one dark, answering to your description, from Masuri, the other almost white, from Kunawur" (*id.* Epist. Nov. 13th, 1869). In a subsequent letter, to the late Mr. W. S. Atkinson, dated Nov. 18th, 1874, Col. Lang writes: "*Sanaca* is an early summer insect, and I think local. At my house in Masuri, in May, 1868, I could always see half a dozen in the air, always at a great height, looking like Swifts or Swallows, until your eye was focused and recognized their size and distance; rarely coming within reach of the longest net, and never settling unless on tree-tops. This species varies in depth and breadth of black markings, and, like all the *Thycas*, it is scented like Jargonelle pears." Mr. L. de Nicéville (Trans. Ent. Soc. Lond. 1889, p. 343) says "through the kindness of Mr. P. W. Mackinnon I have received fourteen males and five females of *D. flavalba* and *Sanaca* from Masuri, and have also before me six males of these two species, also from Masuri, and five males and one female *flavalba* (which constitute the type specimens of that species) from Kunawur, contained in Col. Lang's Collection, captured by himself many years ago. As regards these latter specimens, Col. Lang in discriminating them and Major Marshall in describing them as distinct species, were quite justified, though both the Masuri and Kunawur groups of specimens are very variable in the amount of black markings they exhibit, on both surfaces, there is no connecting link between them. My fresh specimens from Masuri supply this link. When arranged in a graduated series from the lightest marked specimen to the darkest, at no point can you draw the line dividing them into two species. Mr. Mackinnon writes me: 'I am sure the dark and light coloured ones belong to the same species, as I got dozens of all shades in *one* place, and in *one* forenoon. They were all chasing each other, at times six or seven together. Mine were all caught in open places in forests of Mouroo Oak (*Quercus dilatata*) at Nag Tiba, near Masuri, 5,000 feet altitude, in the latter half of May and beginning of June, and at Tehri Gurhwal, near Masuri, 8,500 feet, in June. I have seen them often in Masuri, but captured them very seldom.' I should remark of the female from Masuri that none of them are as light coloured as the palest male *flavala*; in fact, they vary too, but not so much as the male, the lightest specimens equal *flavalba*, the darkest equal *Sanaca*." We possess specimens of both sexes of *Sanaca* from Masuri, taken by the late Capt. T. Hutton. A female from Masuri is in the British Museum Collection, and a male of the pale form (*flavalba*) in the Hewitson Cabinet.

Of our illustrations on Plate 528, figs. 1, 1a, b, are from the Masuri males, and 1c, d, e, from W. Himalayan females.



**DELIAS HORSFIELDII** (Plate 529, fig. 1, 1a ♂ ♀, 1b ♂, 1c ♀, 2 ♂, 2a ♀.)

- Pieris Horsfieldii*, Gray, Zool. Misc. p. 32 (1831). Boisduval, Spéc. Gén. Lép. i. p. 448 (1836).  
 Kollar, Hügel's Reise Kaschmur, iv. 2, p. 408 (1844).  
*Pieris Belladonna*, Gray, Lep. Ins. of Nepal, p. 7, pl. 8, fig. 2 ♂ (1846) Moore, Catal. Lep. Mus. E. I. Company, i. p. 78 (1857); *id.* Proc. Zool. Soc. 1865, p. 758.  
*Thyca Belladonna*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 348.  
*Delias Belladonna*, Elwes, Proc. Zool. Soc. 1882, p. 401. Doherty, Journ. As. Soc. Bengal, 1886, p. 348. de Nicéville, Trans. Ent. Soc. 1889, p. 343; *id.* Sikkim Gazetteer, 1894, p. 165.  
 Mackinnon and de Nicéville, Journ. Bombay N. Hist. Soc. 1898, p. 585, pl. V. fig. 19, *pupa*.  
*Delias Belladonna*, var. *Horsfieldii*, Elwes, Trans. Ent. Soc. 1888, p. 408, pl. 10, fig. 3, ♀. Manders, Trans. Ent. Soc. 1890, p. 533.  
*Delias Hearseyi* et Boyleæ, Butler, Ann. Nat. Hist. 1885, p. 58, ♂; *id.* *l.c.* 1897, p. 161.  
*Delias Belladonna*, vars. *Surya* et *Amarantha*, Mitis, Iris, vi. pp. 132, 133, pl. 2, fig. 3 ♂ (1893).

IMAGO.—Male. Upperside black. *Forewing* with more or less indistinctly defined greyish-white scaled longitudinal streaks within the cell, these streaks in some specimens ending before its apex in a more or less apparent or well-defined whiter oblique bar; beyond is a discal transverse series of more or less defined whitish-grey scaled spots, the lowest being generally elongated and divided by a black line, followed by a submarginal series of similar-scaled lanceolate spots. *Hindwing* with a more or less apparent whitish-grey scaled small divided spot, or a distinct short narrow streak before the apex of the cell, a discal series of white irregularly-quadrate shaped spots, and then a submarginal row of broad lunularly-lanceolate spots; base of abdominal margin broadly greyish-white, the anal area being broadly bright yellow; the costal interspace also bright yellow. Underside. *Forewing* duller black, the white markings more prominent, the apical spots being yellow. *Hindwing* vinaceous-black, the broad cell-streak, basal costal spots, and submarginal spots bright yellow, the discal spots white, the three median being partly yellow and the anal border broadly yellow.

Female. Upperside duller black. *Forewing* with markings similar to the male, except that they are less distinct, and the cell apical-bar only apparent. *Hindwing* also similar to the male, with an elongated cell-streak and full-sized discal spots, basal costal interspace paler, and the anal area much less suffused with pale yellow, or the cell-streak is short and apically restricted or more or less obsolete, the discal and submarginal spots smaller, and the anal area almost or quite white. Underside similar to the male. Occasionally a male occurs (see fig. 2), in which the basal costal interspace and the anal area of the upperside, and all the underside markings are red, and a female (fig. 2a) with dark ochreous-yellow basal costal interspace and whitish anal area of the hindwing on the upperside, and similar dark ochreous-yellow markings on the underside.



Expanse, ♂  $3\frac{1}{4}$  to  $3\frac{3}{4}$ , ♀  $3\frac{1}{2}$  to  $3\frac{3}{4}$  inches.

HABITAT.—W. Himalayas; Nepal; Sikkim; Bhotan; Burma; Shan States.

DISTRIBUTION.—Baron von Hügel's specimens are recorded as having been taken in the "neighbourhood of Masuri" (Kollar, *l.c.* p. 408). Capt. A. M. Lang, in his MS. Notes, dated 1868, writes that he took "*Belladonna* at Masuri, at 7,000 feet elevation, in April, May, and June." Mr. W. Doherty obtained it at "Sargii, Kali, and Gori Valleys, 2,000 to 5,000 feet elevation, in Kumaon" (Journ. As. Soc. Bengal, 1886, 135). Mr. P. W. Mackinnon writes: "*Belladonna* is exceedingly common on the Nag Tiba range, north of Masuri, at about 8,000 feet elevation, from April to July. In Masuri it is usually a rare insect, but in May, 1888, May, 1894, and May, 1895, it was very plentiful. In a few minutes, specimens of all shades of colour, from very dark, almost black examples (typical *Belladonna*), through yellowish-white ones (typical *Sanaca*) to the palest form (*flavalba*) could be caught. It may be noted here that the two last-named forms are strictly confined to the Western Himalayas. Mrs. Robson found the larva feeding on the leaves of *Loranthus longiflorus*, and Mr. Mackinnon found it on *L. vestitus*, N. O. Loranthaceæ. Males are more often caught than females, and may usually be easily distinguished from the females by the bright yellow inner margin of the hindwing on the upperside, which coloration is absent in the opposite sex" (Journ. Bombay N. H. Soc. 1898, 585). Col. Swinhoe (Tr. Ent. Soc. 1893) does not record it from the Khasia Hills. There are specimens in the British Museum of both sexes from Kulu, Kali Valley, Nepal, Sikkim, and from Moolayet, Burma, taken by Col. C. T. Bingham. In Mr. J. H. Leech's Collection are specimens from Sultanpur, Kulu, taken by Capt. G. Young. We possess both sexes from the W. Himalayas, Nepal, Sikkim, Bhotan, Moulmein, and the Karen Hills, Burma. Mr. W. Rothschild possesses it from Haundraw, Burma, and the N. Shan States.

Of our illustrations on Plate 529, figs. 1, 1a are from a W. Himalayan male and female; 1b, c, from Nepal male and female; fig. 2, a male, and 2a a female from the Eastern Himalayas.

**DELIAS ITHIELA** (Plate 530, fig. 1, 1a ♂, 1b, c ♀).

*Thyca Ithiela*, Butler, Ann. and Mag. Nat. Hist. 1869, p. 242, ♂; *id.* Lep. Exotica, p. 62, pl. 24, fig. 1, ♂ (1871); *id.* Ann. Nat. Hist. 1885, p. 339.

*Delias Ithiela*, Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 310. Mitis, Iris, vi. p. 129 (1893). Adamson, List Burm. Butt. p. 41 (1897). Watson, Journ. Bombay Nat. Hist. Soc. 1897, p. 669.

*Delias Belladonna*, var. *Ithiela*, Elwes, Trans. Ent. Soc. Lond. 1888, p. 409, pl. x. fig. 2, ♀. Butler, Ann. Nat. Hist. 1897, p. 162. Adamson, List Burm. Butt. 1897, p. 41.

*Thyca Berinda*, Moore, Proc. Zool. Soc. Lond. 1872, p. 566, ♀. Waterhouse, Aid, i. pl. 12, ♀ (1880).



IMAGO.—Male. Upperside deep black. *Forewing* with the markings less defined than in typical *Horsfieldii*. *Hindwing* with the discal and outer spots smaller, the cell streaks indistinct or quite obsolete, the abdominal margin very dark grey scaled, or almost black, and in some anally sprinkled with yellow scales. Underside blacker than in *Belladonna*. *Forewing* with the markings smaller and less defined. *Hindwing* with the cell mark small and short, the discal and submarginal markings smaller, the abdominal margin either uniformly black, or more or less slightly anally-speckled with yellow scales.

Female. Upperside duller black. *Forewing* with much less defined markings than in male. *Hindwing* also with the markings much less defined, the cell streak either elongate or obsolete, the abdominal margin slightly dark grey-scaled. Underside vinaceous-black, with similar markings to the male.

Expanse, ♂  $2\frac{1}{4}$  to  $2\frac{1}{2}$ , ♀  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches.

HABITAT.—Sikkim; Khasia, Jaintia, and Naga Hills, Assam; Chin Hills, Upper Burma.

DISTRIBUTION AND HABITS.—Mr. H. J. Elwes writes: "I found the dark form, *Ithiela*, most common in Sikkim from May to August, at low elevations, 2,000 to 4,000 feet, where it frequents the banks of streams in hot, thoroughly tropical valleys, and flies slowly about the water-side, resting sometimes on mud and pebbles almost in the water. Some specimens of the variety with yellow on the abdominal margin occur here with the pure black one, and some have white or only a yellow tinge in the same part of the hindwing. But neither Möller nor I have ever taken females with the males in these places, and all the five females I possess of this form were procured from native collectors, and vary in the same particulars as the males. I never saw a typical *Horsfieldii* at these low elevations. In the Khasia Hills I was fortunate enough to find *Belladonna* in its breeding-places, which are small patches of natural forest left on the higher parts of the hills at from 4,000 to 6,400 feet elevation. Here it is in some places abundant, and I found the females almost as plentiful as the males. In the wood which crowns the summit of the Shillong Peak, I had several opportunities of observing the habits of the insect, which are quite different from what I saw in Sikkim. They fly on sunny days about the tops of the trees, and make little excursions into the open country round, always returning to the shelter of the wood, and frequently descending to settle on the flowers of a species of *Euonymus*, and of a large species of *Scabiosa* which grew on its outskirts. The flight is slow, graceful, and soaring, and the butterflies are not at all shy. Here I found hardly any variation in the insects, all being true *Ithiela*, excepting two specimens, which were slightly tinted with yellow on the abdominal margin. I figure a female of the Khasia form=*Berinda*, Moore" (Tr. Ent. Soc. 1888, 408). We possess males from Sikkim, and the female type of *Berinda*, from



the Khasias. Col. C. Swinhoe records it as being "common in the Khasia Hills" (Tr. Ent. Soc. 1893, 310). Mr. Ernest Swinhoe has also received both sexes from his native collectors in the Jaintia Hills. In the British Museum is a female from Runghi, Sikkim, taken in April by Mr. G. C. Dudgeon, a male from the Naga Hills, taken in June by Mr. W. Doherty, and both sexes from Lushai Hills in Mr. P. Crowley's Collection. Col. C. H. E. Adamson possesses "a single female specimen of this butterfly taken at Tiddim, N. Chin Hills, Upper Burma, in October, 1893" (List Burm. Butt. 1897, 41). A female, also from the Chin Hills, is in the British Museum Collection. Capt. E. Y. Watson records "a single quite typical male, taken in the N. Chin Hills at 3,500 feet elevation, in the rainy season" (Journ. Bombay N. H. Soc. 1897, 669). A male from Upper Burma, taken by Mr. T. A. Hauxwell, is in Mr. H. Grossmith's Collection.

Of our illustrations on Plate 530, figs. 1, 1a, are from a Sikkim male, and 1b, c, from the type female named *Berinda*, from the Khasias.

**DELIAS AGLAIA** (Plate 531, fig. 1 *larva* and *pupa*, 1a, b, ♂, 1c, d, ♀).

*Papilio Aglaia*, Linnæus, Syst. Nat. x. ed. i. p. 465 (1758).

*Pieris Aglaia*, Kirby, Trans. Ent. Soc. Lond. 1870, p. 138.

*Delias Aglaia*, Kirby, Syn. Catal. D. Lep. Suppl. p. 795 (1877). de Nicéville, Sikkim Gaz. 1894, p. 165. Butler, Ann. Nat. Hist. 1897, p. 162. Adamson, List Burm. Butt. p. 40 (1897). Watson, Journ. Bombay Nat. Hist. Soc. 1897, p. 669. de Nicéville, Journ. As. Soc. Bengal, 1902, p. 25. Fruhstorfer, Deuts. Ent. Zeit. Iris, 1902, p. 270.

*Papilio Pasithoe*, Linnæus, Syst. Nat. xii. ed. i. 2, p. 755 (1767). Fabricius, Ent. Syst. iii. 1, p. 179 (1793). Donovan, Ins. China, pl. 30, fig. 2, ♂ (1798).

*Pieris Pasithoe*, Godart, Encyc. Méth. ix. p. 148 (1819). Boisduval, Spéc. Gén. Lép. i. p. 451 (1836).

*Delias Pasithoe*, Hübner, Verz. bek. Schmett. p. 91 (1816). Moore, Proc. Zool. Soc. 1878, p. 839. Elwes, Trans. Ent. Soc. 1888, p. 407. Watson, Journ. Bombay Nat. Hist. Soc. 1888, p. 25; *id.* *l.c.* 1891, p. 51. Manders, Trans. Ent. Soc. 1890, p. 532. Swinhoe, Trans. Ent. Soc. 1893, p. 311. Pryer and Cator, Brit. N. Borneo Herald, 1894, p. 285. Walker, Trans. Ent. Soc. 1895, p. 463.

*Thyca Pasithoe*, Wallace, Trans. Ent. Soc. 1867, p. 345. Butler, Catal. Fabr. Lep. B. M. p. 208 (1869). Moore, Proc. Zool. Soc. 1878, p. 701.

*Papilio Dione*, Drury, Illust. Exot. Ent. ii. pl. 8, fig. 3, 4, ♂ (1773).

*Papilio Porsenna*, Cramer, Pap. Exot. i. pl. 43, fig. D, E, ♂ (1776); *id.* *l.c.* iv. pl. 352, fig. A, B, ♀ (1782).

*Delias Dione*, Butler, Trans. Linn. Soc. 1877, p. 550. Moore, Journ. Linn. Soc. Zool. 1886, p. 50. Distant, Rhop. Malay. p. 290, pl. 24, fig. 5, 6, ♂ ♀ (1885). Bartlett, Zool. Note Book, Sarawak, p. 157 (1896).

IMAGO.—Male. Upperside black. *Forewing* with a bluish-grey more or less defined medial cell streaked-patch, and then a prominent greyish-white small spot at the lower apex of the cell and crossed by the lower discocellular veinlet, beneath



which are two lower-discal bluish-grey elongated streaks, the lowest being much the longest, followed by an outer-discal series of prominent greyish-white sagittate marks, of which the upper three or four are elongated and narrow. *Hindwing* with the red tint of the subbasal band of the underside slightly apparent; a bluish-grey transverse broad band extending from middle of the costa and widening across middle of the cell to base of the lower median interspace, beyond which is a prominent greyish-white small oblique spot on the lower discocellular veinlet, followed by an outer discal curved series of five more or less prominent similar-coloured narrow sagittate marks, the submedian and abdominal interspace to near both their ends being pale yellow. Underside duller black. *Forewing* with prominently greyish-white medial-cell bar, lower-discocellular spot and a contiguous upper-discocellular broken spot, the lower-discal outwardly oblique streaks, and the outer discal transverse series of marks. *Hindwing* with a crimson band curving from base of the costa across the cell beyond its base to the abdominal margin, followed by a prominent pale yellow apical cell patch—of which its upper inner end is sometimes broken, upper-discal spots and then a submarginal curved series of spots—of which the upper are oval, the lower elongated, the two lowest being united from the lower median to the abdominal margin.

Female. Upperside dull black. *Forewing* with the cell-bar and lower-discal streaks whitish, and as well-defined as the discocellular spot, and the outer discal series of streaks, the two lower discal being, generally, short and broad. *Hindwing* with the transverse medial-band with its conjoined discocellular spot, broad abdominal area and discal series of streaks, all uniformly whitish, the latter streaks being occasionally dusky scaled. Underside similar to the male.

Expanse, ♂  $2\frac{1}{2}$  to  $3\frac{1}{4}$ , ♀ 3 to  $3\frac{1}{2}$  inches.

HABITAT.—Nepal; Sikkim; Assam; Khasia Hills; Burma; Tenasserim; Shan States. Malay Peninsula; Siam, Annam; Tonkin; Hong Kong; S. China; Hainan; Formosa; Borneo.

LARVA AND PUPA (Plate 531, fig. 1).—"Larva feeds on the parasitic plant of the Roghu tree (*Nauclea Cadamba*), congregating together, closely packed. Pupa formed February 1st, 1880; imago emerged Feb. 18th" (Mrs. E. M. Span, MS. Notes, Nowgong, Assam).

DISTRIBUTION.—We possess specimens of both sexes from Noakote, Nepal, taken by the late Gen. G. Ramsay; also from Sikkim, Cachar, and Silhet. Mr. H. J. Elwes records it as "not uncommon in Sikkim, up to about 3,000 feet elevation, from April to December" (Tr. Ent. Soc. 1888, 407). Mr. L. de Nicéville says that "it occurs in Sikkim, in the low hot valleys commonly throughout the year, except perhaps in the two coldest months" (Sikk. Gaz. 1894, 165). Col. C. Swinhoe has specimens from Cherra Punji in Assam, and from the Khasia Hills. In the British



Museum are specimens from Shillong, Cachar, and Silhet, Assam. Col. C. H. E. Adamson found it "common throughout Burma, especially in November" (List Burm. Butt. 1897, 40). Capt. E. Y. Watson records it "common at Beeling, Upper Tenasserim, from January to April" (J. Bombay, N. H. Soc. 1888, 25), and found it "fairly common at Tilin from December to May" (*id.* 1891, 51), it also being "common in the Upper Chindwin District in April and May, and was also obtained at 3,500 feet elevation in the rainy season" (*id.* 1897, 669). Dr. Leonardo Fea took it at Bhamo in November. Mr. O. Limborg obtained it at "Ahsown, 2,000 feet elevation, and at Taoo, 3,000 feet, Upper Tenasserim, in March" (P. Z. S. 1878, 839). Dr. N. Manders records it "common in the Shan States, nearly all the year round. I have found it up to 5,000 feet elevation" (Tr. Ent. Soc. 1890, 532). In Mr. W. Rothschild's Collection are both sexes from Muong Gnou, Shan States. Dr. J. Anderson took it in Mergui in December, January, and March; on Pataw Island in January, and on Elphinstone Island in March" (J. Linn. Soc. Zool. 1886, 50).

Mr. W. L. Distant records it from the Malay Peninsula, Penang, and Borneo (*l.c.* 290). We possess both sexes from S. China. It occurs also in "Siam, Annam, and Tonkin. Col. C. Swinhoe has both sexes from Tonkin. Mr. J. J. Walker, R.N., records it from Hong Kong" (Tr. Ent. Soc. 1895, 463). The late Consul R. Swinhoe obtained it in Hainan (P. Z. S. 1878, 701).

Of our illustrations on Plate 531, fig. 1, *larva* and *pupa*, is copied from Mrs. Span's original drawing; figs. 1, 1a, from a Nepal male, and 1c, d, from a Chittagong female.

**DELIAS THYSBE** (Plate 532, fig. 1, 1a, ♂, 1b, c, ♀).

*Papilio Thysbe*, Cramer, Pap. Exot. iii. p. 70, pl. 233, fig. C, ♀ (1782).

*Pieris Thisbe*, Boisduval, Spéc. Gén. Lép. i. p. 449 (1836). Doubleday and Hewitson, Gen. D. Lep. i. p. 44 (1846). Gray, Lep. Ins. of Nepal, p. 8, pl. 7, fig. 1, ♀ (1846).

*Thyca Thisbe*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 347.

*Delias Thysbe*, Butler, Ann. Nat. Hist. 1897, p. 165.

*Pieris Acalis*, Godart, Encyc. Méth. ix. p. 148 (1819).

*Thyca Pyramus*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 347.

*Delias Pyramus*, Distant, Rhop. Malay. p. 465, pl. 42, fig. 14 ♂ (1886). Elwes, Trans. Ent. Soc. Lond. 1888, p. 407. de Nicéville, Sikkim Gaz. 1894, p. 165. Watson, Journ. Bombay Nat. Hist. Soc. 1891, p. 51; *id. l.c.* 1897, p. 668. Adamson, List Burm. Butt. p. 40 (1897). Butler, Ann. and Mag. Nat. Hist. 1897, p. 165. Fruhstorfer, Iris, 1902, p. 270.

IMAGO.—Male. Upperside black. *Forewing* with grey-scaled basal cell longitudinal streaks, and an oblique bar at its apex, with two contiguous outer discocellular small spots, two lower-discal streaks, the lowest of which is elongated, and then an outer-discal series of longitudinal lengthened streaks, which latter decrease in length to the posterior angle, and are more sharply defined and pointed



at their inner end. *Hindwing* with a subbasal broad crimson band extending from the costal vein to the submedian across basal half of the cell and traversed by black veins, and its outer edge slightly bordered with grey scales; beyond is an outer-discal series of longitudinal posteriorly-lengthening grey-scaled streaks extending from the costal apex to the lower median—of which the fourth streak enters the apex of the cell, followed by a longer ochreous-yellow submedian interspace, and then a greyish-white abdominal area. Underside. *Forewing* duller black, with the grey markings more defined. *Hindwing* deeper black, with a small ochreous-yellow basal spot; the crimson subbasal band extending to the abdominal margin; the outer streaks more defined, the upper paler grey, the lower paler yellow. Body above greyish-black; thorax clothed with grey hairs; abdomen beneath greyish-white; thorax beneath, palpi, and legs black, grey streaked; antennæ black, annulated beneath with grey.\*

Female. Upperside. *Forewing* similar to the male; the cell-streaks medially restricted, the two lower discal streaks shorter. *Hindwing* similar to the male, except that the crimson band is not outwardly grey scaled, and the outer streaks from the lower subcostal to submedian are ochreous-yellow. Underside similar to the male.

Expanse, ♂ ♀  $3\frac{1}{2}$  to 4 inches.

HABITAT.—Nepal; Sikkim; Bhotan; Assam; Khasias; Burma; Tenasserim; Malay Peninsula; Tonkin.

DISTRIBUTION.—We possess specimens of both sexes from Nepal, taken by the late Gen. G. Ramsay; from Sikkim, taken in April and May; Dhunsari, Assam. Mr. L. de Nicéville records it as “common in Sikkim, at low elevations, from April to December” (Sikk. Gaz. 1894, 165). Mr. Ernest Swinhoe has received it from the Khasia Hills. Capt. E. Y. Watson obtained “a single specimen at Tilin, in December, during the Chin-Lushai Expedition of 1889-90” (J. Bombay N. H. Soc. 1891, 51); he also records “a specimen taken in the N. Chin Hills, at 3,500 feet elevation, in the rainy season” (*id. l.c.* 1897, 668). Col. C. H. E. Adamson obtained it at “Bhamo, in November, and in the Attaran Valley, Upper Tenasserim, in March” (List Burm. Butt. 1897, 40). Signor L. Fea took it at Mateleo, Karen Hills, in August and September, and at Bhamo in September. In the British Museum Collection are specimens from Sikkim, taken by Dr. Pilcher; Bhotan, taken by Mr. G. C. Dudgeon, and from E. Pegu, taken by Mr. W. Doherty.

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\* A variety of the male, from the Khasia Hills, in Mr. W. Rothschild's Collection, has the markings of both wings on the upperside more sharply defined, the hindwing having the broad subbasal band entirely white, instead of crimson, the anal interspaces from the lower median being also white, with the faintest possible tinge of very pale yellow. On the underside of the hindwing the subbasal band and anal area is also white.



Mr. W. L. Distant records it from "Perak, Malay Peninsula" (*l.c.* 465). It also occurs in Tonkin (Fruhstorfer, *l.c.*). Cramer gives China as the habitat of his specimen.

Of our illustrations on Plate 532, figs 1, 1a, are from a male from Assam, and figs. 1b, c, a female from Nepal.

#### DELIAS KANDHA.

*Delias Kandha*, Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 262.

IMAGO.—"Male and female. A local form of *D. Thisbe*, Cram. Allied to *D. Pyramus*, Wallace, from Sikkim. In *Kandha* the ochreous anal area of the hindwing is replaced by pale cream; the light discal areas on the hindwing below, which, in *Pyramus*, are ochreous anally and whitish apically, are, in *Kandha*, of an almost uniform bright yellow hue, inclining to lemon; the ochre spot at the base of the costa of the hindwing below is much larger and more distinct; the apical grey streaks of the forewing above are obscurely tinged with ochreous. All the pale marks are larger, and the black areas smaller and better defined. The female hardly differs from the male. Expanse, 98 millimetres."

HABITAT. Madras.

Described by Mr. W. Doherty from "four males and three females, taken on the Potingi Pass in the Vizagapatam District, Madras Presidency, and the adjoining Jaipur State, at from 3,000 to 5,000 feet elevation, on the Eastern Ghâts" (*l.c.* p. 262).

CHINA AND INDO-MALAY SPECIES.—*Delias Belladonna* (Pap. Belladonna, Fabricius, Ent. Syst. iii. p. 180 (1793). Donovan, Nat. Rep. i. pl. 35, ♀ (1823). Jones' Icones, pl. 37, fig. 2. *Pieris Belladonna*, Boisduval, Spéc. Gén. Lép. i. p. 447 (1836). *Thyca Belladonna*, Butler, Catal. Fabr. Lep. B. M. p. 209 (1869). *Delias Belladonna*, Elwes, Ann. Nat. Hist. 1886, p. 158. Leech, Butt. of China, ii. p. 418, pl. 37, fig. 3, 4, ♂ ♀ (1893). *Syn.* *Delias Zelima*, Mitis, Iris, vi. p. 131 (1893). *Habitat.* W. China.

*Delias Patrua*, Leech, Entom. 1890, p. 46; *id.* Butt. China, ii. p. 442, pl. 37, fig. 1, 2, ♂ ♀ (1893). *Delias Bell. var. Patrua*, Butler, Ann. Nat. Hist. 1897, p. 162. *Habitat.* C. China.

*Delias Lativitta* (*Delias Patrua var. lativitta*. Leech, Butt. of China, ii. p. 422, pl. 35, fig. 1, ♂ (1893). *Habitat.* Moupin, W. China.

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*Delias Chrysorrhæa* (*Pieris Chrysorrhæa*, Vollenhoven, Monogr. Pierides, p. 6,



pl. 2, fig. 4, ♂ (1865). Del. Belladonna, de Nicéville, Journ. As. Soc. Bengal, 1895, p. 487. *Habitat.* Sumatra.

*Delias Ninus* (Thyca Ninus, Wallace, Trans. Ent. Soc. Lond. 1867, p. 347, pl. 6, fig. 5, 5a, ♂. *Delias Parthenope*, Distant, Rhop. Malay, p. 291, pl. 24, fig. 4, ♂ (1885). *Delias Ninus*, Butler, Ann. Nat. Hist. 1897, p. 165. de Nicéville, J. As. Soc. Bengal, 1895, p. 486. *Habitat.* Malacca; Sumatra.

*Delias Parthenope* (Thyca Parthenope, Wallace, Trans. Ent. Soc. 1867, p. 347, pl. 7, fig. 1, ♂). Butler, Ann. Nat. Hist. 1897, p. 163. de Nicéville, J. As. Soc. Bengal, 1895, p. 486. D. Ninus, Distant, *l.c.* p. 291, fig. 98, ♂ (1885). *Habitat.* Singapore; Sumatra.

*Delias Tobahana*, Rogenhofer, Verh. Z. B. Ges. Wien. 1893, p. 571. Mitis, Iris, vi. p. 102, pl. 2, fig. 1, ♀ (1893). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 487. *Syn.* D. Derceto, de Nicéville, J. Bombay Nat. Hist. Soc. 1893, p. 52, pl. L, fig. 4 ♂. *Habitat.* Sumatra.

*Delias Pandecta*, Staudinger, Iris, 1889, p. 23. Butler, Ann. Nat. Hist. 1897, p. 163. *Habitat.* Palawan.

*Delias Pandemia* (Thyca Pandemia, Wallace, Tr. Ent. Soc. 1867, p. 346, pl. 6, fig. 4, 4a, ♂. Butler, Ann. Nat. Hist. 1897, p. 163. *Habitat.* Borneo.

*Delias Henningia* (Pontia Henningia, Esch. Kotzeb. Reise, iii. p. 214, pl. 9, fig. 20, a, b, ♀ (1821). Butler, *l.c.* p. 163. Thyca Hen. Wallace, *l.c.* p. 345, ♂ ♀. *Vars.* Thyca Lucerna et ochreopicta, Butler, Ann. Nat. Hist. 1869, pp. 243-4; *id.* Lep. Exot. pp. 62-3, pl. 24, figs. 2-5 (1871). *Habitat.* Philippines.

*Delias Ottonia*, Semper, Reis Phil. ii. v. p. 235, pl. 34, fig. 7-9 (1890). Butler, *l.c.* 1897, p. 164. *Habitat.* Philippines.

*Delias Egialea* (Pap. Egialea, Cramer, Pap. Exot. ii. pl. 189, fig. D, E, ♂ (1779). Butler, Cist. Ent. i. p. 40, pl. 1, fig. 2, *id.* *l.c.* 1897, p. 164. Thyca Egialea, Wallace, *l.c.* p. 346. *Habitat.* Java.

*Delias Crithoe* (Pieris Crithoe, Boisd. Spéc. Gén. Lép. i. p. 450 (1836). Vollenhoven, Mon. Pier. p. 7 (1865). Thyca Crithoe, Wallace, *l.c.* p. 346. Butler, *l.c.* 1897, p. 164. *Habitat.* Java.

*Delias Bromo*, Fruhstorfer, Ent. Nachr. 1893, p. 335. Butler, *l.c.* 1897, p. 165. *Syn.* *Delias Dymas*, de Nicéville, J. As. Soc. Bengal, 1894, p. 44, pl. 5, fig. 7. *Habitat.* Java.

*Delias Parthenia*, Staudinger, Iris, v. p. 449 (1892). Butler, *l.c.* 1897, p. 165. *Habitat.* N. Borneo.

*Delias Blanca* (Pieris Blanca, Felder, Wien. Ent. Mon. 1862, p. 284; *id.* Reise Nov. Lep. ii. p. 160, pl. 24, fig. 6, 7 (1865). *Habitat.* Luzon.

*Delias Orphne* (Thyca Orphne, Wallace, Tr. Ent. Soc. 1867, p. 361, pl. 8, fig. 2). Distant, Rhop. Malay. p. 293, fig. 101 (1885). Butler, *l.c.* 1897, p. 166. *Habitat.* Malay Peninsula.



*Delias Georgina* (Pieris Georgina, Felder, W. E. M. 1861, p. 298; *id.* Reise Nov. Lep. ii. p. 160, pl. 24, fig. 4, 5 (1865). Butler, *l.c.* 1897, p. 166. *Thyca Georgina* Wallace, *l.c.* p. 361. *Habitat.* Luzon.

*Delias Cinerascens*, Mitis, Iris, vi. p. 126, pl. 2, fig. 2, ♀ (1893). Butler, *l.c.* p. 166. *Habitat.* N. Borneo.

*Delias Simanabum*, Hagen, Iris, vii. p. 34, pl. 1, fig. 3, ♀ (1894). Butler, *l.c.* p. 166. *Habitat.* Sumatra.

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*Delias Hageni*, Rogenhofer, Verh. Z. B. Ges. Wien. 1892, p. 572. Mitis, Iris, 1893, p. 113, pl. 3, fig. 5, ♂. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 489. *Syn.* *Delias Datames*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1893, p. 53, pl. L, fig. 8, ♂. *Habitat.* Sumatra.

#### Genus PICCARDA.

*Piccarda*, Grote, Proc. Amer. Phil. Soc. xxxix. p. 32 (1900).

*Pontia*, Hübner, Verz. bek. Schmett. p. 92 (1816).

*Pieris* (pt.), Doubleday and Hewitson, Gen. D. Lep. i. 42 (1847).

*Thyca* (sect. i., pt.) Wallengren, K. Vet. Akad. Förh., xv. p. 76 (1858). Wallace, Tr. Ent. Soc. Lond. 1867, p. 344.

*Delias* (pt.), Auctorum.

IMAGO.—Wings comparatively broader than in typical *Delias*. Venation similar. *Forewing* less triangular; cell longer. *Hindwing* cell longer. Antennæ with a lengthened slender club; abdomen very densely and compactly scaled.

TYPE.—P. Eucharis.

#### PICCARDA EUCHARIS (Plate 534, fig. 1, larva and pupa, 1a, b, ♂, 1c, d, ♀).

*Papilio Eucharis*, Drury, Illust. Exot. Ent. ii. pl. 10, fig. 5, 6, ♂ (1773). Cramer, Pap. Exot. iii. pl. 201, fig. B, C, ♂; pl. 202, fig. G, ♀ (1779).

*Pontia Eucharis*, Hübner, Verz. bek. Schmett. p. 92 (1816).

*Pieris Eucharis*, Doubleday and Hewitson, Gen. D. Lep. i. p. 44 (1846). Moore, Catal. Lep. Mus. E. I. Company, i. p. 80, pl. 1, fig. 1, 1a, larva and pupa (1857). Lang, Ent. Mo. Mag. 1864, p. 102.

*Thyca Eucharis*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 351. Rothney, Ent. Mo. Mag. 1882, p. 35.

*Delias Eucharis*, Moore, Lep. of Ceylon, i. p. 140, pl. 54; fig. 1, 1a, ♂ ♀, 1b, larva and pupa (1881); *id.* Proc. Zool. Soc. 1882, p. 256. Swinhoe, P. Z. S. 1885, p. 139; *id.* *l.c.* 1886, p. 431. de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51; *id.* *l.c.* 1899, p. 210. Elwes, Trans. Ent. Soc. 1888, p. 407. Hampson, J. As. Soc. Beng. 1888, p. 363. Taylor, List of Orissa Butt. p. 88 (1888). Watson, Journ. As. Soc. Beng. 1890, p. 268; *id.* Journ. Bombay N. H. Soc. 1890, p. 8.



Davidson and Aitken, J. Bombay N. H. S. 1890, p. 358; *id.* 1896, p. 569. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 445. de Nicéville, Sikkim Gaz. 1894, p. 166. Kirby, Allen's Nat. Libr. Butt. ii. p. 167, pl. 56, fig. 1, 2 (1896). Butler, Ann. Nat. Hist. 1897, p. 144. Mackinnon, Journ. Bombay, Nat. Hist. Soc. 1898, p. 586.

*Piccarda Eucharis*, Grote, Proc. Amer. Phil. Soc. 1900, p. 32.

*Pieris Epicharis*, Godart, Encyl. Méth. ix. p. 153 (1819). Boisduval, Spéc. Gén. Lép. i. p. 456 (1836).

*Papilio Hyparete*, Herbst, Nat. Schmett. v. pl. 101, figs. 3, 4, 5, ♂ ♀ (1792).

IMAGO.—Male. Upperside creamy-white. *Forewing* with all the veins black lined; crossed by an outer-discal black narrow band, the black expanding on each vein and then dilating outwardly—thus forming a marginal band enclosing a submarginal series of white outwardly-pointed conical spots. *Hindwing* with a similar but less defined black outer-discal slender band and marginal dilated end to the veins, enclosing a row of pale pink broad cordate spots. Underside. *Forewing* similar to the upperside, except that the veins are broader black bordered. *Hindwing* with all the veins black bordered; the outer-discal black narrow band and marginal end of the veins prominent, enclosing a series of bright scarlet cordate spots edged with white; the inner area from base to discal band pale lemon-yellow, or sometimes ochreous-yellow, except anteriorly, where it is white.

Female. Upperside creamy-white. Both wings with all the veins broader black bordered than in the male; on the *hindwing* the discal and marginal band is also broader, and the pink cordate spots more defined. Underside similar to the male.

Expanse, ♂ ♀  $2\frac{3}{4}$  to  $3\frac{1}{4}$  inches.

LARVA.—Subcylindrical; head small; body sparsely clothed with fine long hairs; colour ochreous-brown, minutely white spotted; head and legs black.

PUPA.—Thick anteriorly; with a frontal short spine and dorsal row of short black spines; colour yellow, spotted with black.

HABITAT.—Lower Himalayas; Continental India; Ceylon.

LARVA; HABITS, ETC.—“The larva may be found in the Kanara District of Bombay, from the beginning of August, everywhere, on the common ‘Mistletoe’ (*Loranthus longiflorus*), from which it will drop and hang by a thread if the tree is shaken; we have never found it feeding on anything else. The larva is long, cylindrical and smooth, with an oily gloss; two subdorsal rows of long white bristles springing from minute white tubercles; head, sides and back sparsely clothed with short white bristles; colour brown, head and feet black. Unlike most butterflies, this species lays as many as 20 or 30 eggs on the underside of one leaf, in parallel rows, with equal intervals, and the larvæ continue in some measure gregarious to the last, so that a large number of pupæ are often found, at little distance from each other, on a wall, or the trunk of a tree. The pupa is closely attached by the tail and





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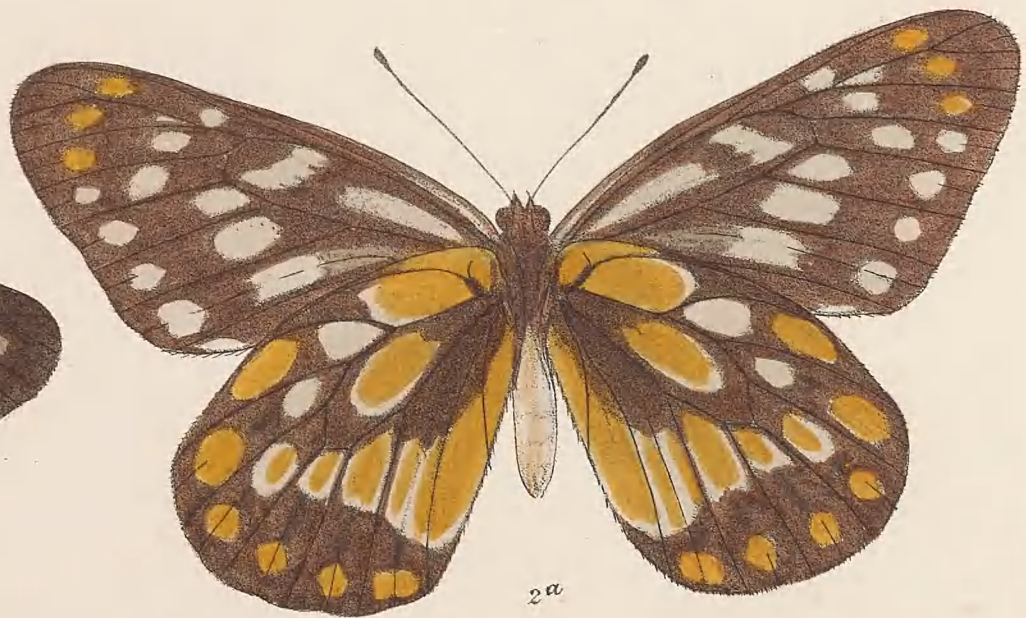
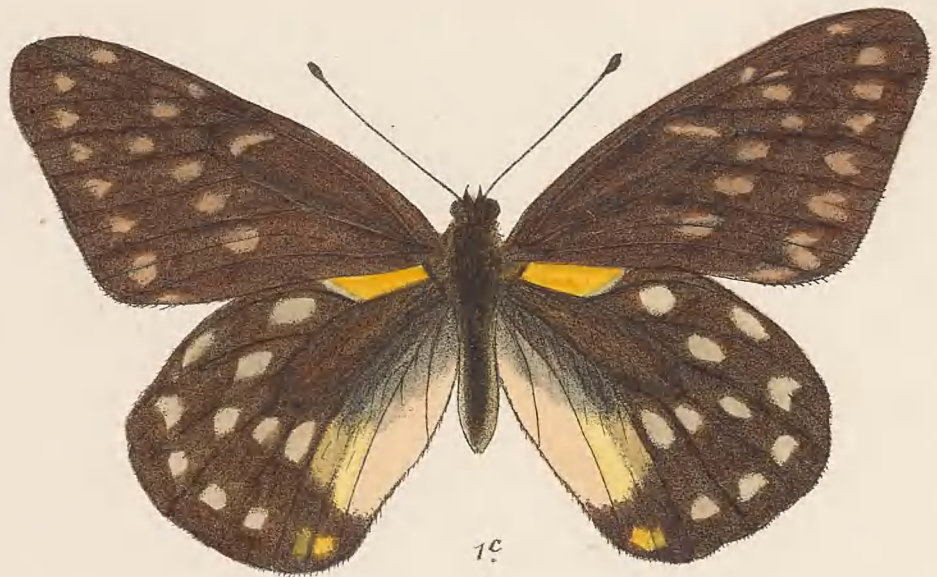
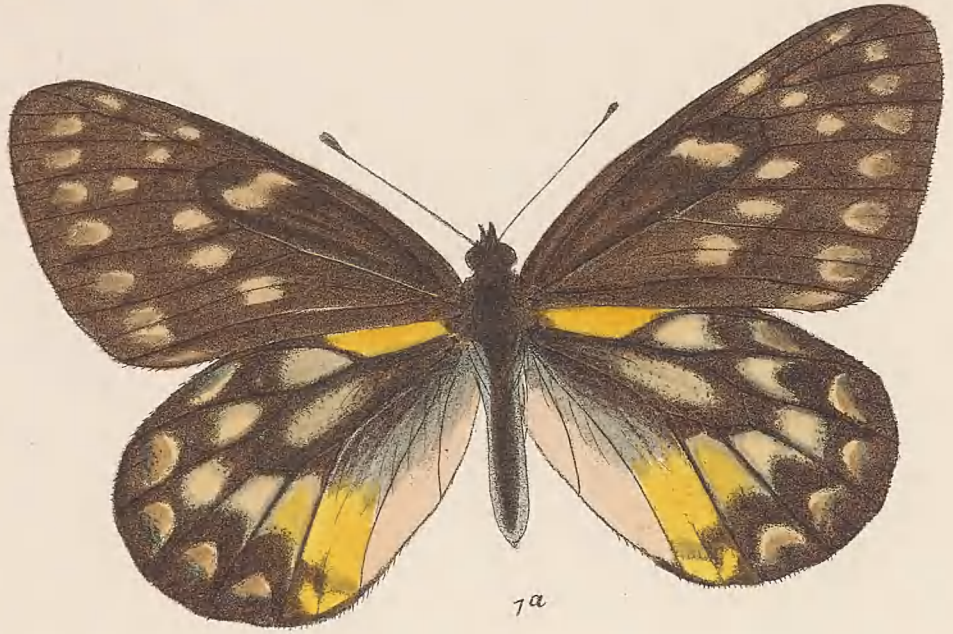
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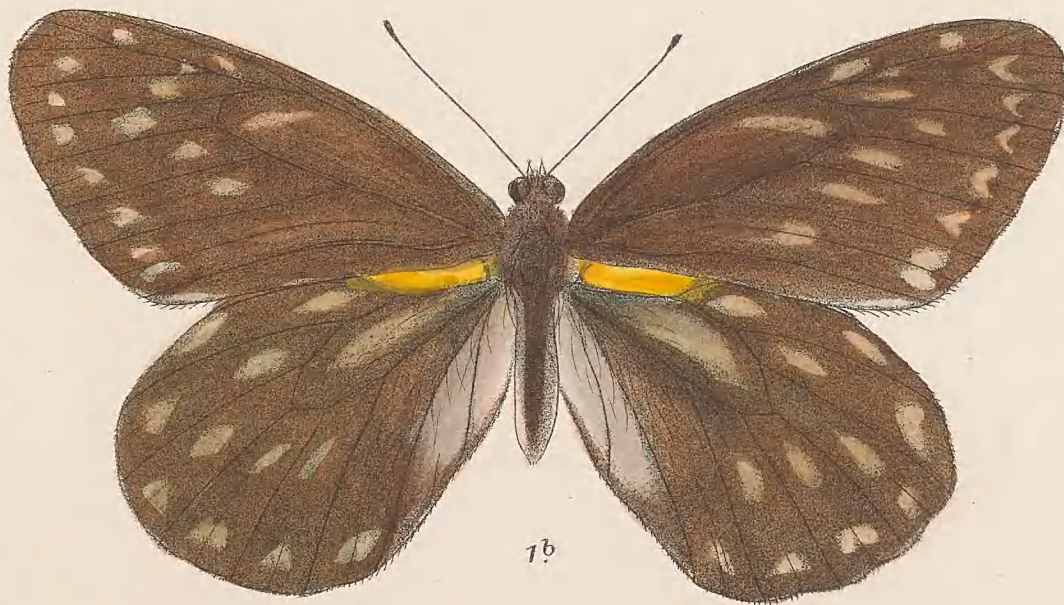
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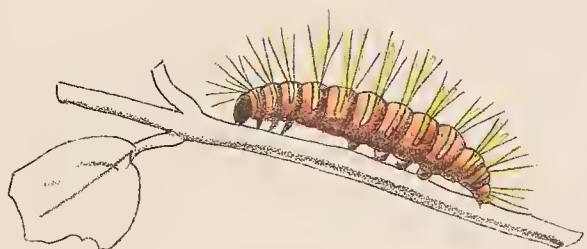


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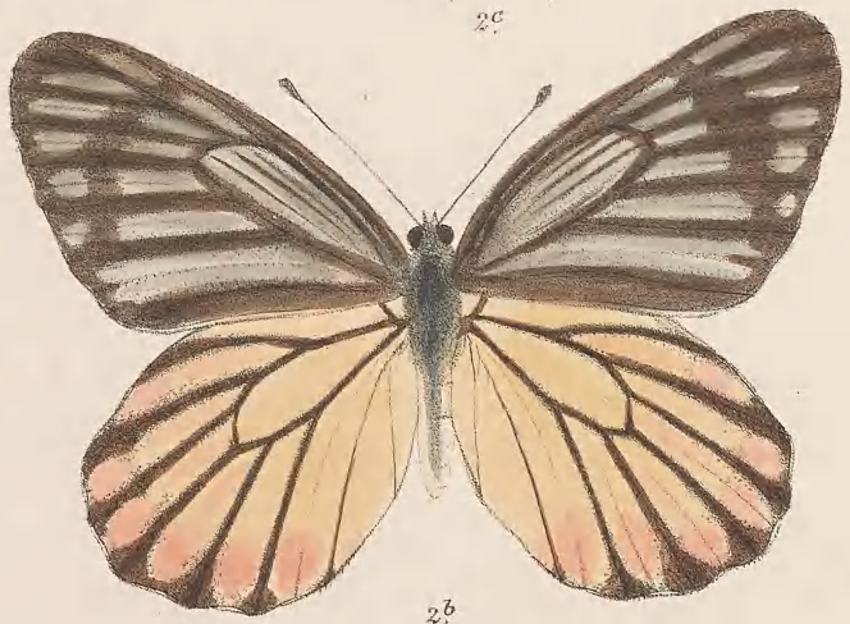
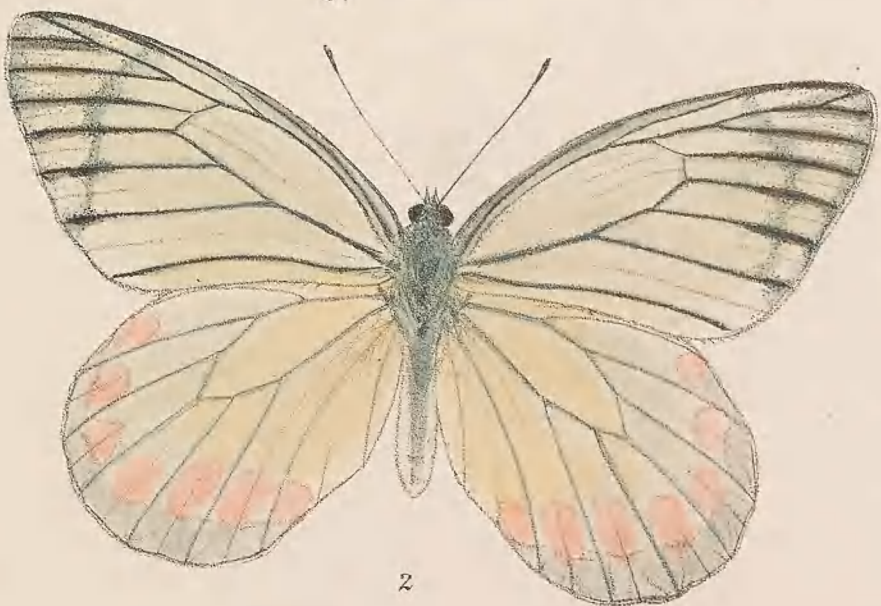
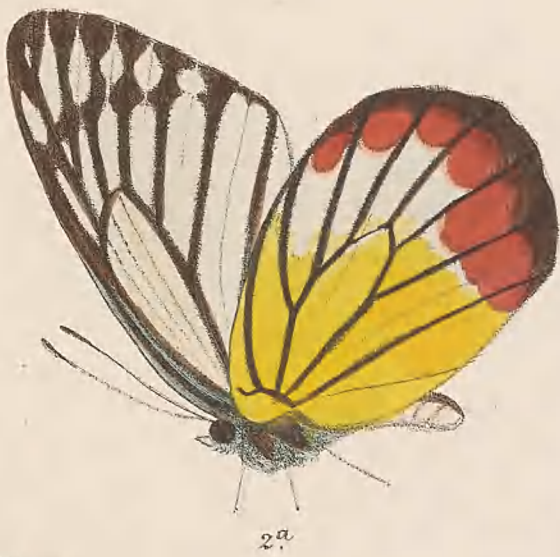








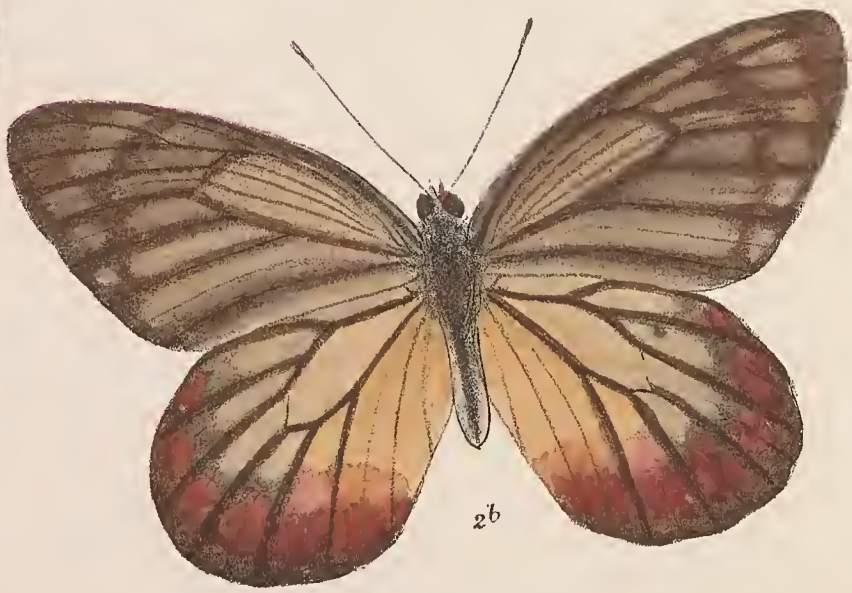
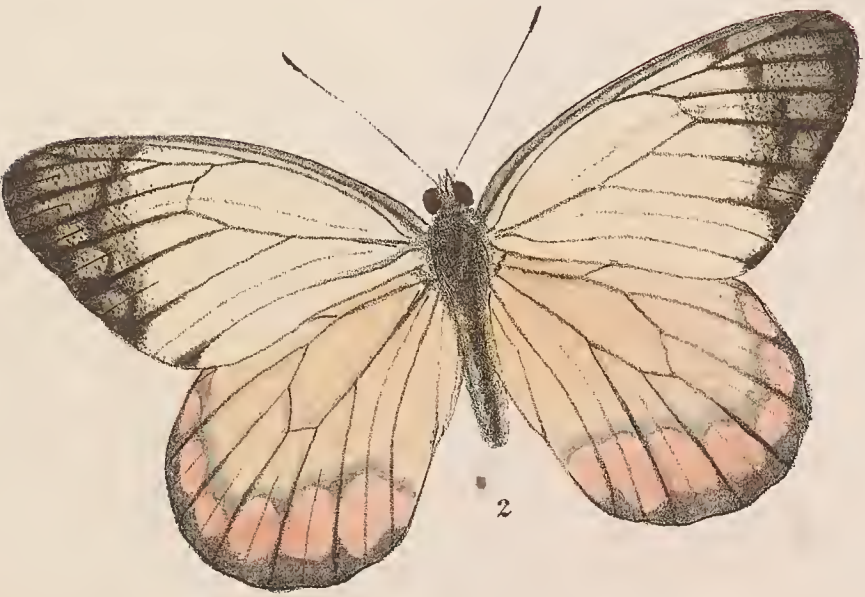
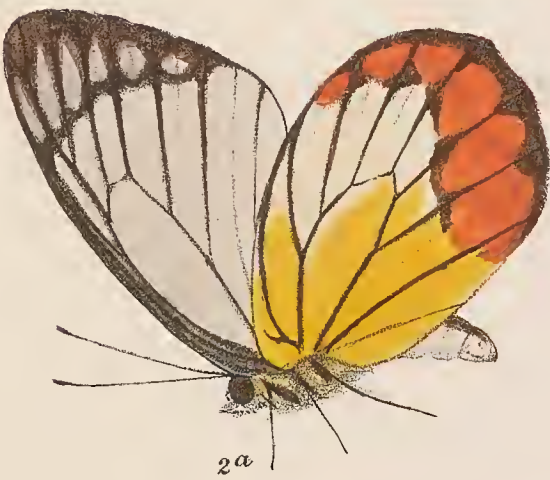
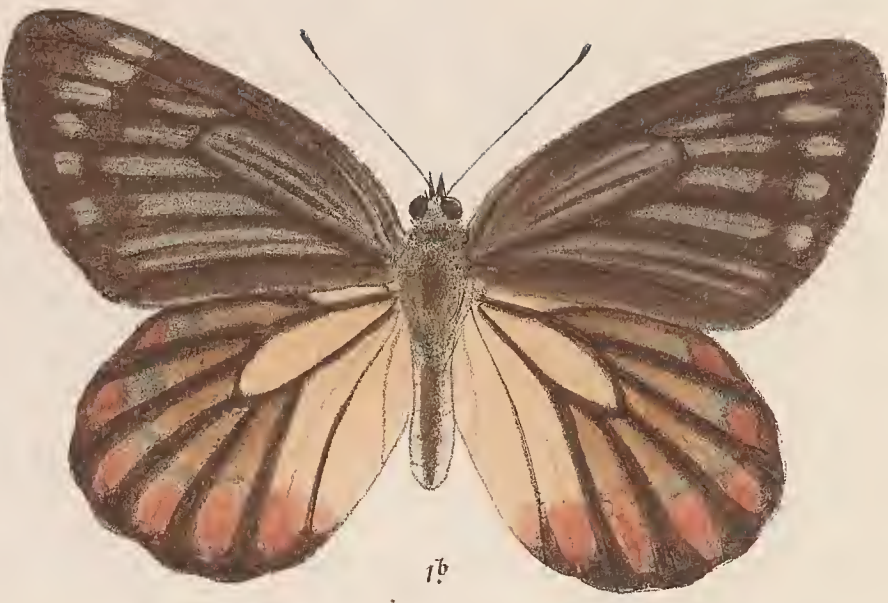
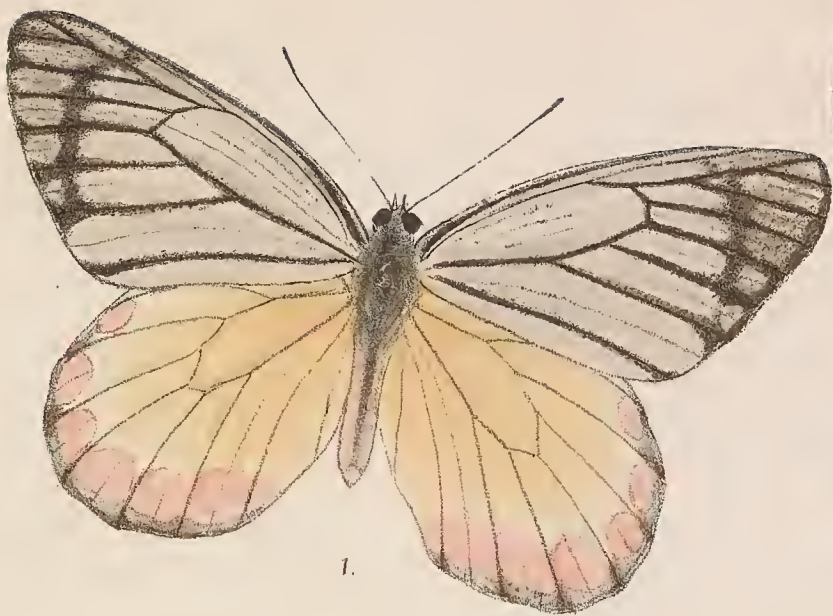


























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by a band, generally to a vertical surface, with the head upwards. It is moderately stout, with a short snout, two small tubercles on the head, a sharp but not prominent dorsal ridge on the thorax, continued in a row of tubercles on the abdominal segments; below these are two partial subdorsal rows; colour bright yellow; tubercles and a row of spots defining the wing cases black. Large numbers are destroyed by a Dipterous parasite, very like a common house-fly" (J. Davidson and E. H. Aitken, *l.c.* p. 358).

The late Mr. S. N. Ward, in his MS. Notes on Kanara butterflies, writes, "The larva of *P. Eucharis* is social in its habits, and feeds on the *Hibiscus chinensis*. Remains in the pupa state about ten days, head upwards."

DISTRIBUTION.—Mr. W. Doherty records it "from Almora, Ranibagh, at from 1,000 to 5,000 feet elevation, in Kumaon" (J. As. Soc. Beng. 1886, 135). Capt. H. B. Hellard obtained it at "Allahabad" (MS. Notes). Mr. P. W. Mackinnon records it as being "very common in the Dehra Dun, from July to February" (J. Bombay N. H. S. 1898, 586). Capt. A. M. Lang records its capture in "Oudh and Umballa" in the Plains (Ent. Mo. Mag. 1864, 102). Capt. H. L. Chaumette, in his MS. Notes writes, "This butterfly may be seen in Lucknow, Oudh, in numbers, towards the close of the year to March, at which latter period it will be seen flying round the Mango trees in search of the parasitic plant (*Loranthus longiflora*) on which to deposit its eggs." Capt. Chaumette also records it "very common at Saugor, also in Calcutta, and from Bombay to Saugor. Flies from December to August" (Ent. M. Mag. 1865, 37). Col. C. Swinhoe found it "common everywhere in Bombay and the Dekkan all the year round. The larva feed on *Santalum album*, length one and a half inch, colour greenish-brown. Pupa pale yellow, spotted with black, suspended by a thread round the body; they are much troubled by the Ichneumon, and of 15 pupæ found on a gate-post at Poona, only one had escaped, the Ichneumon larvæ being clearly visible through the skin of the pupa, there being from 2 to 7 larvæ in each pupa" (P. Z. S. 1885, 139). Dr. R. W. Forsayeth writes, "Mhow, November 22nd; found one larva of this butterfly just fastened up, and about to change to pupa. The pupæ are, however, generally found on leaves of *Butea frondosa*. The pupæ are fastened by a thoracic brace and a caudal ligature to the underside of leaves, and are of two colours" (Tr. Ent. Soc. 1884, 385). Messrs. Davidson and Aitken record it as "very common in Kanara District of Bombay at all seasons, except during the two or three months when the rainfall is heaviest" (J. Bombay N. H. S. 96, 569). Capt. E. Y. Watson took it in Mysore, at Arsikari, Kadur, and Kathlekan, in November; also at Sagar in January" (J. Bomb. N. H. Soc. 1890, 8). Mr. G. F. Hampson obtained it in the "Nilgiris at 1,000 to 7,000 feet" (J. As. Soc. Beng. 1888, 363). Mr. H. S. Ferguson found it "very common in Travancore, both in the low country and up to 3,000 feet in the Hills" (J. Bomb. N. H. S. 1891, 445).



In Ceylon, Dr. Thwaites found the larva feeding on *Loranthus*. Mr. F. M. Mackwood records it as being common throughout the low country, and up to 4,000 feet altitude; at times a few occur higher up. The larvæ feed on the parasitic *Loranthus*, sometimes in thousands, but fortunately Ichneumons destroy the greater number" (Lep. Ceylon, i. 140, 1881). In Madras Capt. E. Y. Watson "took it in July and August" (J. As. Soc. Beng. 1890, 268). Mr. W. C. Taylor records it "very common at Khorda, Orissa" (List, p. 15, 1888). Mr. L. de Nicéville states that it "swarms in the neighbourhood of Calcutta in the winter; specimens are to be met with throughout the year" (J. As. Soc. Beng. 1885, 51). Mr. J. Rothney says "it is the commonest butterfly in Barrackpur Park, near Calcutta; it occurs in numbers from April to October" (Ent. M. Mag. 1882, 35).

In Sikkim, writes Mr. H. J. Elwes, "it occurs at low elevations from April to October" (Tr. Ent. Soc. 1888, 407).

We possess specimens from Kasauli, W. Himalaya; Nepal, taken by Genl. G. Ramsay; Bombay, Nilgiris, and Ceylon; also a male, labelled "Burmah," but which locality is doubtless incorrect.

Of our illustrations on Plate 534, fig. 1 larva and pupa, is copied from Mr. A. Grote's Calcutta drawing; 1a, b, a W. Himalayan male, and 1c, d, a Nepal female.

**PICCARDA HIERTE** (Plate 532, fig. 2, 2a, ♂, 2b, c, ♀; Plate 533, fig. 1, 1a, ♂, 1b, c, ♀).

*Pontia Hierte*, Hübner, Zuträge Exot. Schmett. i. p. 17, fig. 77, 78, ♂ (1818); *id.* Verz. bek. Schmett. p. 92 (1818).

*Pieris Hierte*, Moore, P. Z. S. 1865, p. 758.

*Delias Hierte*, Druce, P. Z. S. 1874, p. 108. Watson, Journ. Bombay N. H. Soc. 1888, p. 25; *id.* l.c. 1891, p. 51; *id.* 1897, 668. Manders, Tr. Ent. Soc. 1890, p. 533. Swinhoe, Trans. Ent. Soc. Lond. 1893, p. 311. de Nicéville, Sikkim Gaz. 1894, p. 166. Adamson, List Burm. Butt. p. 41 (1897). Butler, Ann. Nat. Hist. 1897, p. 144. Fruhstorfer, Iris, 1902, p. 270.

*Thyca Hierte*, var. *Indica*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 351, ♂ ♀. Elwes, *id.* l.c. 1888, p. 408.

*Delias Indica*, Moore, Proc. Zool. Soc. Lond. 1878, p. 839.

*Thyca Devaca*, Moore, Proc. Zool. Soc. Lond. 1872, p. 566, ♀.

IMAGO.—Male. Upperside greyish-white. *Forewing* with the veins either only slenderly greyish-black lined and the black scales obscurely expanding on each side of the veins obliquely before the apex, and then dilating at their end from the subcostal to lower median, thus enclosing an apical series of ill-defined whitish streaks, or the veins are also broadly black bordered, with their subapical expansion and dilated end also broader and more prominently black, and the cell streaks of the underside slightly visible. *Hindwing* with the veins greyish-white, the submarginal scarlet spots and dark marginal band of the underside being faintly indicated; in



some specimens the marginal end of the outer veins is also very slightly and obscurely speckled with minute black scales. Underside white. *Forewing* with all the veins broadly black bordered, the apical white streaks being more defined; also with more or less distinctly defined black longitudinal cell-streaks. *Hindwing* with all the veins narrowly black bordered; the basal area to, or more or less beyond, the cell, either pale or dark yellow, with a submarginal series of bright scarlet spots increasing in size from the apex, followed by a bordering outer marginal black uneven band.

Female. Upperside. *Forewing* greyish-black, with either moderately well-defined white or greyish-white cell-streaks and narrow discal and apical streaks, or all these streaks are obscurely defined and narrow, and are more or less nearly obliterated by black scaling. *Hindwing* either white, with all the veins broadly greyish-black bordered and widening outwardly and dilated on the margin, with pale pink indications of the submarginal scarlet spots of the underside, or, dull-white, with the veins outwardly more broadly but less prominently blackish bordered, their ends more broadly diffused and with dusky-reddish indications of the spots of the underside. Underside similar to the male, except that on the *forewing* the black bordering to the veins is broader, and the upper apical streaks are sometimes yellow-tinted, and on the *hindwing* the veins sometimes are broader black, the scarlet spots broader, and the yellow filling up the entire discal area, and, more rarely, as in *Devaca*, the costal interspace and the cell area is dark scarlet.

Expanse, ♂ ♀ 3 to  $3\frac{1}{2}$  inches.

HABITAT.—Kumaon; Nepal; Sikkim; Khasia Hills; Lower Bengal; Burma; Upper Tenasserim; Siam; Saigon; Tonkin.

DISTRIBUTION.—A male from Rhaniket, Kumaon, Western Himalayas, taken in May, is in Mr. W. Rothschild's Collection. We possess both sexes from Nepal, taken by the late Genl. G. Ramsay. Mr. H. J. Elwes records it as "not uncommon in Sikkim, at low elevations, and up to 3,000 feet, from March to December" (Tr. Ent. Soc. 1888, 408). Mr. L. de Nicéville says "it is a rare species in Sikkim, and occurs only in the low valleys and outer slopes of the hills" (Sikk. Gaz. 1894, 166). Col. C. Swinhoe records it from the Khasia Hills (Tr. Ent. Soc. 1893, 311). Mr. de Nicéville, "a single male taken in Calcutta in February" (J. As. Soc. Beng. 1885, 51). Capt. E. Y. Watson obtained it at "Tilin, in March, during the Chin-Lushai Expedition of 1889-90" (J. Bombay N. H. Soc. 1891, 51), and also at Rangoon (*id. l.c.* 1888, p. 25). Capt. Watson also found it "common in the Upper Chindwin District, Burma, in May; also obtained up to 6,500 feet in the Hills" (*l.c.* 1897, 668). Mr. O. Limborg took it "above Ahsown; Moulmein to Meetan, and at Moolai, 3,000 to 6,000 feet elevation" (P. Z. S. 1878, 839). Col. C. H. E. Adamson remarks that it is "common in all Burma" (List, 1897, 41). Dr. L. Fea obtained



it at Meteleo in August, Cobaga, and at Bhamo in November. Dr. N. Manders found it "not uncommon in the Shan States, occurring also in Eastern Karenee" (Tr. Ent. Soc. 1890, 533).

Of our illustrations on Plate 532, fig. 2, 2a, 2b, c, are from a Nepal male and female. On Plate 533, fig. 1, 1a, 1, b, c, are from a Burmese male and female.

#### PICCARDA ETHIRE.

*Delias Ethire*, Doherty, Journ. Asiatic Soc. Bengal, 1886, p. 268, ♂ ♀. Taylor, Butt. of Orissa, p. 15 (1888). Butler, Ann. and Mag. Nat. Hist. 1897, p. 144.

IMAGO.—"Male and female. The male closely resembles *Delius Hierte*, var. *Indica*. It is a whiter insect, the apex being but slightly clouded with grey, the subapical band distinctly marked, being grey, with the spaces beyond it partly of almost pure white. The cell of the forewing is white above and hardly touched with grey below. The upper two or three apical pale spaces tinged with yellowish. Hindwing immaculate except for the grey terminations of two or three of the veins. The scarlet spots of the hindwing below are transmitted through the wing as a pink band. Below, the disc, base and abdominal margin of the hindwing are bright lemon-yellow, becoming whitish outwardly on the disc, the scarlet submarginal band is rather narrow and even. Female. Like the male, and has little resemblance to the female of *Hierte*; it is white, all the veins accentuated with black, the extreme apex and the subapical band of the forewing dark grey, leaving a whitish band tinged with ochreous across the apex. Below, the female is like the male, the apex of the forewing is more distinctly marked with lemon-yellow, and the veins and subapical band are darker, the cell marked with perceptible grey lines. The brilliant lemon and scarlet hues of the hindwing are transmitted through the wing, appearing above as creamy and pink. The two lower discocellulars of the forewing are less oblique and more angled outwardly than in *Hierte*, resembling those of *Eucharis*. A local form of *Hierte*."

"Expanse, 98 millimetres."

HABITAT.—Madras; Orissa; Lower Bengal.

DISTRIBUTION.—"Common in the Vizagapatam District, Madras Presidency, at Bobbili, Parvatipuram, the Pottingi Ghât, etc., and in the Jaipur State, probably extending to the Godavari; scarce in the Ganjam District, Mahendragiri; also seen in Southern Orissa, where it is probably rare" (Doherty, *l.c.* 263). A male and female from Berhampur, Madras, are in the British Museum. A male, from the Sunderbunds, Lower Bengal, is in Col. C. Swinhoe's Collection. "Very common at Khorda, in Orissa" (W. C. Taylor, *l.c.*)



**PICCARDA METARETE** (Plate 533, fig. 2, 2a, ♂, 2b, c, ♀).

*Delias Metarete*, Butler, Trans. Linn. Soc. Lond. 1879, p. 550; *id.* Ann. Nat. Hist. 1897, p. 145.

Moore, Journ. Linn. Soc. Lond. Zool. 1886, p. 49.

*Delias Hyparete*, var. *Metarete*, Distant, Rhop. Malayana, p. 292, pl. 24, fig. 13, 14, ♂ ♀ (1885).

IMAGO.—Male. Upperside similar to *P. Hierte*. *Forewing* with more uniformly grey-scaled apical interspaces. *Hindwing* with distinctly-defined black-scaled marginal border. Underside. *Forewing* similar to *Hierte*. *Hindwing* with the yellow colour more basally restricted; the submarginal scarlet spots inwardly black bordered, the two anal spots also being larger.

Female. Upperside duller greyish-black than in *Hierte*. *Forewing* with obscurely-defined markings, the discal series comparatively broader. *Hindwing* with broader black outer border, enclosing the dusky reddish indications of the spots. Underside. Similar to the male.

Expanse, ♂ ♀, 3 to  $3\frac{1}{4}$  inches.

HABITAT.—Lower Tenasserim; Malay Peninsula; Penang; Sumatra; ? Borneo.

DISTRIBUTION.—We possess specimens of both sexes from Dr. J. Anderson, taken in “Mergui, in December and January; Elphinstone Island in March, and on King Island in January” (J. Linn. Soc. Zool. 1886, 49).

Of our illustrations on Plate 533, fig. 2, 2a, and 2b, c, are from Mergui male and female.

**PICCARDA AGOSTINA** (Plate 535, fig. 1, 1a, ♂, 1b, c, ♀).

*Pieris Agostina*, Hewitson, Exot. Butt. i. *Pieridæ*, pl. 1, fig. 1, 2, ♂ (1852). Moore, Catal. Lep. Mus. E. I. Company, i. p. 81, ♂ (1857).

*Thyca Agostina*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 353.

*Delias Agostina*, Elwes, Tr. Ent. Soc. Lond. 1888, p. 408. Watson, Journ. Bombay Nat. Hist. Soc. 1888, p. 25; *id. l.c.* 1891, p. 51; *id.* 1897, p. 668. Manders, Tr. Ent. Soc. 1890, p. 533.

de Nicéville, Sikkim Gaz. 1894, p. 166. Swinhoe, Tr. Ent. Soc. 1893, p. 311. Adamson, List Burm. Butt. 1897, p. 41. Butler, Ann. Nat. Hist. 1897, p. 159.

*Pieris Nesba*, Lucas, Rev. Zool. 1852, p. 324, ♀.

IMAGO.—Male. Upperside. *Forewing* greyish-white; costal margin speckled with greyish-black scales; an apical-marginal blackish-scaled band enclosing five or six white spots. *Hindwing* creamy-white with the marginal dark border of the underside slightly apparent. Underside. *Forewing* with all the veins broadly black, the apical spotted-band as above. *Hindwing* rich chrome-yellow; with a narrow black marginal band traversed by white lunular spots. *Body* greyish white; legs black, streaked with white; antennæ above black, beneath annulated with white.

Female. Upperside. *Forewing* greyish-black; with indistinct greyish-white



scaled cell area, discal elongate streaks, and subapical small linear spots. *Hindwing* sullied pale chrome-yellow; the base sparsely irrorated with minute grey-black scales; a greyish-black marginal band enclosing ill-defined greyish-white marks. Underside similar to the male, except that the black vein-borders of the forewing are broader. *Body* above greyish-black, beneath greyish-white.

Expanse,  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches.

HABITAT.—Nepal; Sikkim; Assam; Khasia Hills; Burma.

DISTRIBUTION.—We possess specimens of the male from Nepal, taken by the late Genl. G. Ramsay. Mr. H. J. Elwes records it as “not uncommon in Sikkim in the lower valleys, from March to December” (Tr. Ent. Soc. 1888, 408). Col. C. Swinhoe says it is “very common in the Khasia Hills” (*l.c.* 1893, 311). In Burma, Capt. E. Y. Watson took “one male in the N. Chin Hills, at 7,000 feet altitude in May, and a female at the foot of the Hills in April” (J. Bombay N. H. Soc. 1897, 668). Capt. Watson also took a “single pair at Tilin in November and March, during the Chin-Lushai Expedition of 1889-90” (*l.c.* 1891, 51); he also found it “common at Beeling, Upper Tenasserim, from May to September, and at Paungadaw, Upper Burmah, in October and November” (*l.c.* 1888, 25). Col. C. H. E. Adamson “caught only three specimens of this butterfly, in April, October, and December respectively, two in Arakan, and one in Upper Chindwin” (List Burm. Butt. 1897, 41). Dr. L. Fea obtained it at Moolayet in March, and in the Karen Hills. Dr. N. Manders found it “widely distributed in the Shan States at low elevations, being abundant in the Mone Valley” (Tr. Ent. Soc. 1890, 533). We possess males from the Upper Mekong, Shan States, taken by Mr. R. Roberts, C.E.

**PICCARDA AGORANIS** (Plate 535, fig. 2, 2a, ♂).

*Delias Agoranis*, Grose-Smith, Ann. Nat. Hist. 1887, p. 266; *id.* Rhop. Exot. ii. *Del.* pl. 1, fig. 7, 8, ♂ (1893). Adamson, List Burm. Butt. 1897, p. 40. Butler, Ann. Nat. Hist. 1897, p. 156.

*Delias Agostina* subsp. *infumata*, Fruhstorfer, Iris, 1902, p. 174.

IMAGO.—Male. Upperside white. *Forewing* with the costal border broadly greyish-black scaled, these scales also extending along upper edge and end of the cell, and from thence outward to the marginal blacker band, which latter is traversed by a series of small narrow whitish spots. *Hindwing* with a marginal row of ill-defined black-scaled triangular spots, the three lower of which are most distinct. Underside. *Forewing* with black-bordered veins. The upper discal white intervening-streaks short and widely separated from the white cell area. *Hindwing* pale lemon-yellow; the black marginal band broader and enclosing six broad white spots.

Female. Upperside. *Forewing* fuliginous-black; cell area and elongated streak between the veins sullied greyish-white. *Hindwing* white with fuliginous-black



outer marginal border, and submarginal greyish-white interspaces. Underside. *Forewing* with broader blackish vein-borders than in the male. *Hindwing* as in the male.

Expanse, ♂ ♀  $2\frac{3}{4}$  inches.

HABITAT.—Tenasserim, Burma.

DISTRIBUTION.—The type specimen of this species was taken by Col. C. H. E. Adamson at "Tounggya Sekkan, Middle Tenasserim, in April, 1880" (*l.c.* 40). In the British Museum collection is a male from Mergui, and a female from Tavoy Valley.

Our illustration on Plate 535, fig. 2, 2a, are from the type specimen.

**PICCARDA DESCOMBESI** (Plate 536, fig. 1, 1a, ♂, 1b, c, ♀).

*Pieris Descombesi*, Boisduval, Spéc. Gén. Lép. i. p. 465 (1836). Doubleday and Hewitson, Gen. D.

Lep. i. p. 45 (1846). Moore, Catal. Lep. Mus. E. I. Company, i. p. 81 (1857).

*Thyca Descombesi*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 350.

*Delias Descombesi*, Moore, Proc. Zool. Soc. 1878, p. 839. Butler, P. Z. S. 1872, p. 34. Distant, Rhop. Malay, p. 466, pl. 42, fig. 16, ♂ (1886). Elwes, Journ. As. Soc. Bengal 1886, p. 433. Trans. Ent. Soc. 1888, p. 408. Manders, Tr. Ent. Soc. 1890, p. 532. Watson, Journ. Bombay Nat. Hist. Soc. 1891, p. 51. Swinhoe, Trans. Ent. Soc. 1893, p. 310. de Nicéville, Sikkim Gaz. 1894, p. 166. Adamson, List Burm. Butt. p. 41 (1897). Butler, Ann. Nat. Hist. 1897, p. 148. Fruhstorfer, Iris, 1902, p. 270.

IMAGO.—Male. Upperside greyish-white. *Forewing* with the costal border and an apical-marginal band black scaled. *Hindwing* with the outer margin edged with black scales. Underside. *Forewing* greyish-black, the costal, subcostal, the median and its branches, and submedian vein basally bordered with greyish-white scales, those on the medians and submedian forming longitudinal streaks; a broad greyish-white discocellular oblique-bar which is sometimes more or less broken; beyond is a submarginal series of greyish-white spots, of which the four upper are elongated, and the lower somewhat cordate. *Hindwing* rich deep chrome-yellow, with a black-edged broad crimson streak in the costal interspace, and a black marginal inner-dentated band enclosing a series of six diffusedly-formed lunate spots, which latter are either yellowish-white or of a uniformly chrome-yellow. *Body* greyish-white; palpi and legs black streaked; antennæ black.

Female.—Upperside. *Forewing* greyish-black; costal, medians, and submedian vein narrowly bordered with greyish-white scales; a broad greyish-white complete or broken discocellular-bar, and a submarginal curved-row of spots. *Hindwing* greyish-white or pale yellowish-white, basally irrorated with pale greyish-black scales; a broad greyish-black marginal inner-dentated band enclosing a series of ill-defined whitish hastate marks. Underside. *Forewing* similar to the male. *Hindwing* also similar to the male, except that the ground-colour is either almost



white or of various shades of paler yellow, and the cell and lower basal area irrorated with blackish scales.

Expanse, ♂  $2\frac{1}{2}$  to  $3\frac{1}{2}$ , ♀ 3 to  $3\frac{1}{2}$  inches.

HABITAT.—Sikkim; Bhotan; Khasia Hills; Burma; Tenasserim; Malay Peninsula; Siam; Annam; Cochin China.

DISTRIBUTION.—Mr. H. J. Elwes records it “common in Sikkim at low elevations, and up to 3,000 feet, from March to December. Fond of settling on the sweet-scented flowers of *Cinchona Ledgeriana* in the lower plantations at Mongpo” (Tr. Ent. Soc. 1888, 408). Mr. L. de Nicéville says it is “common in Sikkim from March to December. It is an early riser, and commences to fly soon after sunrise” (Sikk. Gaz. 1894, 166). Mr. G. C. Dudgeon obtained it in Bhotan. Col. C. Swinhoe has received “several specimens from the Khasia Hills” (Tr. Ent. Soc. 1893, 310). Col. C. H. E. Adamson records it as “very common in Burma from March till November” (List Burm. Butt. 1897, 41). Capt. E. Y. Watson obtained “two males at Tilin in December and May, during the Chin-Lushai Expedition of 1889-90” (J. Bombay N. H. Soc. 1891, 51). Mr. O. Limborg took it “at Ahsown; Moolai, at 3,000 to 6,000 feet elevation, Upper Tenasserim” (P. Z. S. 1878, 839). Dr. L. Fea obtained it at Toungoo in January. Dr. N. Manders records it as “very common in the Shan States” (Tr. Ent. Soc. 1890, 532). Mr. H. J. Elwes records “a single female taken in Tavoy” (J. As. Soc. Beng. 1886, 433).

INDO-MALAY SPECIES.—*Piccarda Hæmorrhœa* (Pieris Hæmorrhœa, Vollenhoven, Monogr. Pier. p. 10, pl. 2, fig. 5 (1865). Thyca Hæm. Wallace, Tr. Ent. Soc. Lond. 1867, p. 352. Delias Hæm. Butler, Ann. Nat. Hist. 1897, p. 145. *Habitat.* Banca.

*Piccarda Niasana* (Delias Niasana, Kheil, Rhop. Nias. p. 35, pl. 4, fig. 22, 23 (1884). Butler, *l.c.* 1897, p. 146, *var.* D. Amarilla, Kheil, *l.c.* p. 35. *Habitat.* Nias Island.

*Piccarda Hyparete* (Pap. Hyparete, Linn. Syst. Nat. x. ed. i. p. 469 (1758); *id.* Mus. Ulr. p. 247 (1764); *id.* S. N. xii. ed. i. p. 763 (1767). Clerck, Icones, ii. pl. 38, fig. 2 (1764). Sulzer, Gesch. Ins. p. 143, pl. 15, fig. 8 (1776). Herbst, Nat. Schmett. v. p. 131, pl. 101, fig. 6, 7, ♀ (1792). Pieris Hyparete, Boisd. Spéc. Gén. Lép. i. p. 455 (1836). Vollenhoven, Monog. Pier. p. 91 (1865). Snellen, Tijds. v. Ent. 1876, p. 154. Thyca, Hyp. Wallace, Trans. Ent. Soc. 1867, p. 352. Delias Hyp. Aurivillius, K. Svensk. Vet. Akad. Handl. 1882, p. 59. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 488. Butler, Ann. Nat. Hist. 1897, p. 146. *Syn.* Pap. Antonoe, Cramer, Pap. Exot. ii. p. 138, pl. 187, fig. C, D, ♂ (1779). *Habitat.* Penang; Singapore; Sumatra; Java; Borneo.

*Piccarda Luzoniensis* (Pieris Luzoniensis, Felder, Wien. Ent. Monats. 1862, p. 285. Thyca Luzon, Wallace, *l.c.* p. 352 (1867). Delias Luzon, Butler, *l.c.* p. 146.



*Var. Delias Palawanica* Staudinger, *Iris*, ii. p. 24 (1889). *Var. D. Mindanaensis*, Mitis, *Iris*, vi. p. 139, pl. 2, fig. 4, 5 (1893). *Habitat.* Philippines; Formosa.

*Piccarda Lucina* (*Delias Lucina*, Distant, *Ann. Nat. Hist.* 1887, p. 270. Butler, *l.c.* p. 147. *Syn. D. Joloana*, Staudinger, *Iris*, ii. p. 24 (1889). *Habitat.* Sulu Archipelago.

*Piccarda Simplex* (*Delias simplex*, Butler, *Ann. Nat. Hist.* 1897, p. 147, ♂. *Habitat.* Sumatra.

*Piccarda Stollii* (*Delias Stollii*, Butler, *Proc. Zool. Soc.* 1872, p. 32, *id.* *Ann. Nat. Hist.* 1897, p. 147. *Syn. Pap. Antonoe*, Stoll, *Cramer's Pap. Exot.* v. pl. 33, fig. 2, 2b (1790). *Habitat.* China.

*Piccarda Belisama* (*Pap. Belisama*, Cramer, *Pap. Exot.* iii. pl. 258, fig. A-D. (1782). *Pontia Bel.* Horsfield, *Catal. Lep. Mus. E. I. Company*, pl. 4, fig. 10, 10a, *larva* and *pupa* (1829). *Pieris Bel.* Boisd. *Spéc. Gén. Lép.* i. p. 464 (1836). Moore, *Catal. Lep. Mus. E. I. C.* i. p. 82, pl. 1, fig. 14, 14a, *larva* and *pupa* (1857). Vollenhoven, *Mon. Pier.* p. 16 (1865). *Thyca Bel.* Wallace, *l.c.* p. 349 (1867). *Delias Bel.* Butler, *l.c.* p. 149 (1897). Kirby, *Allen's Nat. Libr.* ii. p. 166, pl. 57, fig. 1, ♀ (1896). *Vars. Delias Nakula*, Grose-Smith and Kirby, *Rhop. Exot.* i. *Del.* pl. 1, fig. 1-4, ♂ ♀ (1889). *Del. aurantia*, Doherty, *Journ. As. Soc. Bengal*, 1891, p. 189. *Del. Belisar*, Staudinger, *Iris*, 1891, p. 78. Grose-Smith and Kirby, *l.c.* ii., *Del.* pl. 2, fig. 6, 7 (1893). *Del. Vestalina*, Staudinger, *Iris*, 1891, p. 79. *Del. erubescens*, Staudinger, *l.c.* p. 80. *Habitat.* Java.

*Piccarda Eumolpe* (*Delias Eumolpe*, Grose-Smith, *Ann. Nat. Hist.* 1889, p. 312. Pryer and Cator, *Brit. N. Borneo Herald*, 1894, p. 285. *Habitat.* N. Borneo.

*Piccarda Glauce* (*Pieris Glauce*, Butler *Proc. Zool. Soc.* 1865, p. 431, pl. 25, fig. 2. *Thyca Glauce*, *l.c.* p. 439 (1867). *Delias Glauce*, de Nicéville, *Journ. As. Soc. Beng.* 1895, p. 488. Butler, *Ann. N. H.* 1897, p. 150. *Habitat.* Sumatra; Borneo.

*Piccarda Diaphana* (*Delias Diaphana*, Semper, *Verh. Hamb.* iii. p. 114 (1878); *id.* *Reise Phil.* v. p. 228, pl. 34, fig. 3-6 (1890). Butler, *l.c.* p. 150 (1897). *Habitat.* Philippines.

*Piccarda Peribœa* (*Pieris Peribœa*, Godart, *Encycl. Méth.* ix. p. 154 (1819). *Thyca Per.* Wallace, *l.c.* p. 354. *Delias Per.* Butler, *l.c.* p. 153 (1897). *Syn. Del. Wallacei*, Rothschild, *Iris*, v. p. 441, pl. 5, fig. 2 (1892). *Habitat.* Java.

*Piccarda Alтивaga* (*Delias Alтивaga*, Fruhstorfer, *Ent. Nachr.* 1893, p. 333; *id.* *Stett. Ent. Zeit.* 1894, p. 121, pl. 4, fig. 8. Butler, *l.c.* p. 155 (1897). *Habitat.* Java.

*Piccarda Themis* (*Pieris Themis*, Hewitson, *Exot. Butt.* ii. *Pieris*, pl. 5, fig. 31, 32 (1861). *Thyca Themis*, Wallace, *l.c.* p. 354, ♀ (1867). *Delias Themis*, Butler, *l.c.* p. 156 (1897). *Habitat.* Philippines.



*Piccarda Singapura* (Thyca Singapura, Wallace, *l.c.* p. 353, pl. 7, fig. 2, ♂ (1867). *Delias* Sing. Distant, *Rhop. Malay.* p. 293, fig. 100 (1885). de Nicéville, *Journ. As. Soc. Beng.* 1895, p. 489. Butler, *l.c.* p. 156 (1897). *Habitat.* Singapore; Sumatra; Borneo.

*Piccarda Dives* (*Delias Dives*, de Nicéville, *Journ. As. Soc. Bengal*, 1897, p. 562, pl. 1, fig. 1, ♂. *Habitat.* Penang.

*Piccarda Cathara* (*Delias Cathara*, Grose-Smith, *Ann. Nat. Hist.* 1893, p. 34; *id.* *Rhop. Exot. ii. Del.* pl. 5, fig. 7, 8 (1895). Butler, *l.c.* p. 156 (1897). *Habitat.* Borneo.

*Piccarda Nausicaa* (*Delias Nausicaa*, Fruhstorfer, *Berl. Ent. Zeit.* 1899, p. 60; *id.* *Stett. Ent. Zeit.* 1902, p. 358. *Habitat.* Borneo.

*Piccarda Annamitica* (*Delias Agostina Annamitica*, Fruhstorfer, *Soc. Entom.* 1901, p. 98; *id.* *Iris*, 1902, p. 173. *Habitat.* S. Annam.

*Piccarda Baracasa* (*Delias Baracasa*, Semper, *Reise Phil. Lep.* p. 230, pl. 34, fig. 2 (1890). Butler, *l.c.* p. 156 (1897). *Habitat.* Philippines.

*Piccarda Danala* (*Delias Danala*, de Nicéville, *Journ. Bombay Nat. Hist. Soc.* 1893, p. 51, pl. L, fig. 9 ♂; *id.* *J. As. Soc. Bengal*, 1895, p. 489. Butler, *l.c.* p. 157 (1897). *Syn.* *Delias* Karo, Hagen, *Iris*, vii. p. 33, pl. 1, fig. 4 ♂ (1894). *Habitat.* Sumatra.

*Piccarda Vishnu* (*Pieris Vishnu*, Moore, *Catal. Lep. Mus. E. I. Company*, i. p. 83, pl. 2a, fig. 5, ♂ (1857). *Delias Vishnu*, Butler, *l.c.* p. 153 (1897). *Habitat.* Java.

#### Genus PRIONERIS.

*Prioneris*, Wallace, *Trans. Ent. Soc. Lond.* 1867, p. 383. Watson, *Lit. and Phil. Soc. Manchester*, 1867, p. 260. Butler, *Cistula Entom.* i. p. 39, pl. 1, fig. 1 (1870); *id.* *Proc. Zool. Soc.* 1872, p. 27. Moore, *Lep. of Ceylon*, i. p. 140 (1881). Schätz, *Exot. Schmett.* ii. p. 64 (1886). Kirby, *Allen's Nat. Libr. Butt.* ii. p. 171 (1896). Fruhstorfer, *Berl. Ent. Zeit.* 1899, p. 105.

*Pieris* (Sect. i. pt.), Doubleday and Hewitson, *Gen. D. Lep.* i. p. 44 (1847).

IMAGO.—Wings large. *Forewing* triangular; costa much arched from the base, apex obtusely-pointed, exterior margin very oblique, uneven; costal margin in the male, thickened and minutely serrated; costal vein extending nearly two-thirds its length; subcostal vein four-branched, its first branch emitted at nearly one-half and second at one-fourth before end of the cell, third bifid, the fourth being thrown off at one-third before the apex, and the upper radial at one-fourth from beyond the cell; upper discocellular very oblique, lower less oblique, lower radial from their angle; cell broad, extending to nearly two-thirds length of the wing; middle median at one-fourth and lower one-half before end of the cell; submedian vein slightly



concave near the base. *Hindwing* broadly oval; exterior margin uneven; basal area from the subcostal to internal vein very hairy; precostal vein curved; costal vein arched; first subcostal emitted at one-half before end of the cell; discocellulars very long and outwardly oblique, upper slightly concave, radial from their angle; cell extending to two-thirds length of the wing; middle median at nearly one-fourth and lower at one-half before end of the cell; submedian vein straight, internal recurved. *Body* stout; abdomen compactly scaled above, finely hairy basally, beneath finely hairy from base to claspers; thorax and head hairy; palpi long, very laxly hairy beneath; legs long; antennæ long, with a gradually thickened club.

TYPE.—*P. Thestylis*.

MIMICRY.—Mr. A. R. Wallace writes, "The species of *Prioneris*, in several cases, seem to mimic those of the genus *Thyca*. The male of *P. Thestylis*, on the underside, most strikingly imitates *Thyca Belladonna*, while the female resembles it on the upperside as well. *P. Sita* is a perfect representation of *T. Eucharis*. The species of *Thyca* are very abundant and are weak, slow-flying insects, while the species of *Prioneris* that mimic them are rare, and the pairs which resemble each other inhabit the same district" (*l.c.* 383). Mr. L. de Nicéville says that the *P. Sita* of Ceylon "is a splendid mimic in both sexes, of the highly protected *Delias Eucharis*, but its more rapid and somewhat darting flight makes it easily distinguishable when on the wing" (*Journ. As. Soc. Bengal*, 1899, 210).

The species of this genus, according to the examinations made by Mr. J. Watson (*l.c.* 1867, 259) do not possess androconial scales.

#### PRIONERIS THESTYLIS.

*Wet-season form* (Plate 538, fig. 1, 1a, ♂, 1b, c, d, e, ♀; 539, 1, 1a, ♀).

*Pieris Thestylis*, Doubleday, Gray's Zool. Misc. p. 76, ♂ (1842); *id.* Gen. D. Lep. i p. 44, pl. 6, fig. 2, ♂ (1847). Moore, Catal. Lep. Mus. E. I. Company, i. p. 78 (1857); *id.* Proc. Zool. Soc. Lond. 1865, p. 759.

*Prioneris Thestylis*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 384, ♂ ♀. Butler, Cistula Entom. i. p. 39 (1870); *id.* Proc. Zool. Soc. 1872, p. 27. Staudinger and Shatz, Exot. Schmett. ii. p. 64, pl. 6 (1886). Elwes, Trans. Ent. Soc. Lond. 1888, p. 410, ♂ ♀. Swinhoe, *id.* *l.c.* 1893, p. 310 de Nicéville, Sikkim Gaz. 1894, p. 166. Kirby, Allen's Nat. Libr. Butt. ii. p. 171 (1896). Adamson, List Burm. Butt. p. 41 (1897). Watson, Journ. Bombay Nat. Hist. Soc. 1897, p. 669. Fruhstorfer, Berl. Ent. Zeit. 1899, p. 107.

*Pieris Seta*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 78, ♀ (1857); *id.* Proc. Zool. Soc. Lond. 1857, p. 102, pl. 44, fig. 3, ♀. Fruhstorfer, *l.c.* p. 108 (1899).

IMAGO.—Male. Upperside greyish-white. *Forewing* with the median vein and its branches basally black-lined; the costal border black, the black curving obliquely outward across end of the cell, thence broadly bordering the outer veins to the



margin and enclosing a series of greyish-white upper-discal streaks and a submarginal row of spots, the upper of both series are slender and elongated, the next two lower pairs being each slightly coalescent, and the next lower large and broad; the cell area with grey streaks indicating the dark markings on the underside. *Hindwing* with grey indications of the dark markings of the underside; with a black outer marginal dentated band, the angles of which extend more or less up the veins, and a more or less apparent submarginal narrow lunular band, thus enclosing a series of either slightly-defined or prominent, white, broad outwardly-pointed spots. Under-side. *Forewing* greyish-black including the cell area; the discal and marginal markings, similar to the upperside, white, except those at the apex, which are yellow, the cell area also being marked with white basal streaks and anterior spots. *Hindwing* vinaceous-black, with lemon-yellow broad elongated cell-streak, basal costal spot, a discal series of spots increasing in size and length to the abdominal margin, followed by a marginal row of rounded spots. *Body* above greyish-white; thorax in front, collar, front, and palpi black, streaked with white; thorax beneath black; legs black and streaked with white; antennæ black.

Female. Upperside dull vinaceous-black or deep black. *Forewing* with ill-defined whitish or prominent white slender basal streaks and small anterior spots within the cell, a discal series of small narrow spots, two elongated slender basal streaks below the cell, and a submarginal row of smaller and narrower spots; the upper of each row being elongated and the next pairs slightly coalescent. *Hindwing* with an ill-defined whitish narrow elongated streak within the cell, a discal curved series of small narrow spots, which increase in size from the costal to the lower median interspace, from whence the whitish area broadly expands upward to the base and outward to the abdominal margin, this lower broad area being either sullied yellowish-white or pale clear yellow. Under-side. *Forewing* greyish-black, with white markings, as on the upperside, except that the apical streaks are tinted with yellow, the duplex streak below the cell is wider, and the veins are also slenderly-edged with greyish-white. *Hindwing* olivescence-black, with markings, as on the upperside, prominent, and all yellow including a streak at base of the costa. In some females, the upperside has more prominent markings, the hindwing a broad white cell-streak, larger discal spots, which latter, from the middle median, are also more elongated and of a deep diffused yellow colour, and are sometimes coalescent with the opposite marginal white spots. And, on the underside, the ground-colour is dark vinaceous-black or vinaceous-brown, with the markings of the hindwing deeper yellow, the cell streak and the middle discal spots bordered with white. *Body* greyish-black; abdomen beneath greyish-white; collar, front, palpi, and legs, white streaked.

Expanse, ♂  $3\frac{3}{4}$  to  $4\frac{1}{2}$ , ♀  $3\frac{1}{2}$  to 4 inches.



*Dry-season form* (Plate 539, fig. 2, 2a, ♂, 2b, c, ♀).

*Prioneris Watsoni*, Hewitson, Trans. Ent. Soc. Lond. 1868, p. 100, ♀. Butler, Proc. Zool. Soc. 1872, p. 28. Moore, Proc. Zool. Soc. 1878, p. 839. Adamson, List Burmese Butt. 1897, p. 41. Fruhstorfer, Berl. Ent. Zeit. 1899, p. 110.

*Prioneris Seta*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 384, ♂.

MALE and FEMALE. Smaller in size than the *wet-season form*. MALE. Upperside similar. *Forewing* differs in the black apical portions being narrower, and the cell area showing less indications of the dark markings of the underside. *Hindwing* with a very slender black marginal border only, or, in some, this border is very slightly dentate at the end of the veins; the yellow colour of the underside being indicated by a delicate flush within the cell and outer interspaces. Underside. *Forewing* similar to the upperside, except that the dark portion is purplish-brown or pale purplish-black, including the upper half of the cell area; the spots at the apex of the wing are smaller and yellow, or sometimes obsolescent. *Hindwing* with the basal dark portions purplish-brown, the middle of the cell, the basal spot, and outer interspaces being chrome-yellow with white borders, the discal and marginal spots being also confluent within each interspace.

Female. Upperside white, approximating to the male. *Forewing* with the cell area and outer veins broadly black bordered; the cell area with black longitudinal streaks and anteriorly-enclosed white spots. *Hindwing* with a narrow black marginal dentated band, and a lower discal broad diffused chrome-yellow patch. Underside. *Forewing* as in the male, except that the cell area is black and enclosing white basal streaks and anterior spots. *Hindwing* with the basal dark portions and marginal border purple-brown, with chrome-yellow markings, as in the male.

Expanse, ♂  $2\frac{1}{2}$  to 3, ♀ 3 to  $3\frac{1}{4}$  inches.

LARVA.—Unknown.

HABITAT.—Sikkim; Bhotan; Assam; Burma; Upper Tenasserim; Shan States.

DISTRIBUTION.—Mr. H. J. Elwes records "the males not uncommon in Sikkim, up to 4,000 or 5,000 feet elevation, throughout the season; the female rarer. I have also a male from Buxa, Bhotan" (*l.c.* 410). Mr. L. de Nicéville says it is "a common species in Sikkim at elevations below 5,000 feet all through the warm weather. The females are very rare. It is strongly affected by the seasons; the dry-season form found early in the year has been named *Watsoni*" (*l.c.* 66). Col. C. Swinhoe records it as being "common in the Khasia Hills" (*l.c.* 310). Mr. W. Rothschild possesses specimens of both sexes from "Sadarghat, Assam." Col. C. H. E. Adamson took "three specimens of *Thestylis*, in March and April, on the Lampha Choung, near Tao, Middle Tenasserim, and two of *Watsoni* in February at Thounggya Sekkan" (List Burm. Butt. 1897, 41). Capt. E. Y. Watson obtained "a



single specimen of the dry-season form (*Watsoni*) at the foot of the Chin Hills, in March" (*l.c.* 669). Mr. O. Limborg records taking *Watsoni* on the road from "Moulmein to Meetan, and at Houngduran, Upper Tenasserim" (P. Z. S. 1878, 839). Dr. N. Manders writes, "I have specimens of *Thestylis* from Fort Stedman and Bernardmyo, Shan States. The females are mimics of *Delias Belladonna*. I have not taken *Watsoni* in the Shan States, and but rarely in Karenee" (Tr. Ent. Soc. 1890, 533). We possess both sexes of *Thestylis* from Sikkim, males from the Khasias; Manipur; Upper Tenasserim taken by Col. C. T. Bingham in April; Upper Mekong, Shan States, taken by Mr. J. Roberts, C.E.; and of *Watsoni*, males from Sikkim, Silhet, Moulmein, and Upper Mekong.

Of our illustrations on Plate 538, fig. 1, 1a, and 1b, c, are from a *wet-season* male and female from Sikkim; fig. 1d, e, from a Khasia female. On Plate 539, fig. 1, 1a, are from a *wet-season* female from Sadarghat, Assam; fig. 2, 2a, are from a *dry-season* male, from the Khasias, and fig. 2b, c, the female, the latter taken from Hewitson's type specimen of *Watsoni*.

**PRIONERIS SITA** (Plate 536, fig. 2, ♂, 2a, b, ♀, 2c, *pupa*).

*Pieris Sita*, Felder, Reise Novara, Lep. ii. p. 161, pl. 25, fig. 12, ♂ (1865).

*Prioneris Sita*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 385. Butler, P. Z. S. 1872, p. 28. Moore, Lep. of Ceylon, i. p. 141, pl. 54, fig. 2, ♂ (1881); *id. l.c.* iii. p. 532, *larva* (1887). de Nicéville, Journ. As. Soc. Bengal, 1899, pp. 173, 210. Davidson and Aitken, Journ. Bombay Nat. Hist. Soc. 1896, p. 570. de Nicéville, Journ. As. Soc. Bengal, 1900, p. 250. Fruhstorfer, Berl. Ent. Zeit. 1899, p. 110.

IMAGO.—Male. Upperside greyish-white. *Forewing* with the costa and all the veins black-lined, the black on the outer veins expanding at their end and forming a very narrow marginal border, the submarginal narrow band of the underside very slightly indicated by a few minute black scales. *Hindwing* with the outer veins black only at their end, where it more or less expands and forms a slender black marginal border; a submarginal very slightly defined slender sparsely black-scaled band, the enclosed marginal interspaces being flushed with pale pink and indicating the spots of the underside. Underside. Both wings with all the veins black-lined, and the submarginal black narrow band distinct. *Forewing* with slightly apparent slender black longitudinal cell-streaks, and the apical interspaces pale yellow. *Hindwing* with the basal area to the submarginal band yellow, the outer marginal interspaces being scarlet, each bordered with white.

FEMALE. Upperside with all the veins broader black-lined and the submarginal lunular band more distinctly formed; cell areas with slender slightly defined black linear streaks. Underside similar to the male.

Expanse, ♂ ♀  $3\frac{1}{4}$  to  $3\frac{1}{2}$  inches.



LARVA.—“Colour dull blue-green. Head and all the segments closely dotted with minute blue tubercles, those on the head and sides black tipped; dorsal surface pubescent; a lateral fringe of soft white hair below the spiracles. Feeds on *Capparis*.”

PUPA.—“Bright green. Sharply pointed at the head; with two strong lateral points and keeled on dorsal surface of thoracic segments; an interrupted yellow lateral line, and a short curved crimson line on each side just below thoracic segments bordering a small white irregular black speckled spot” (E. E. Green, MS. Note, July, 1886).

HABITAT.—Ceylon; S. India.

DISTRIBUTION.—In Ceylon, Mr. F. M. Mackwood says this species occurs in the “Hills from 2,000 to 6,000 feet elevation, and is comparatively scarce” (Lep. Ceylon, i. 141). Mr. L. de Nicéville records it as “fairly common in Ceylon at moderate elevations. Dr. N. Manders has taken it in Punduloya in January, and has noted its occurrence, amongst other places, at Haputale, 5,000 feet, Koslande, 2,500 feet, Behilul, 2,200 feet, and Wellaway, 500 feet. It is a splendid mimic in both sexes of the highly protected *Delias Eucharis*, Drury, but its more rapid and somewhat darting flight makes it easily distinguishable when on the wing; the acutely-pointed apex of the forewing is also a noticeable feature even in flight. The female is very rare” (Journ. As. Soc. Bengal, 1899, 210.) In the British Museum Collection is a male from Kandy taken in July by Col. J. W. Yerbury.

Of its occurrence in the Kanara District, South India, Messrs. Davidson, Bell, and Aitken write, “It cannot be distinguished from *Delias Eucharis* on the wing, unless a very close and clear view is obtained; so doubtless we have seen more than we know, but we have only caught seven specimens in all. Of these, two were caught at the Gairsoppa Falls, or on the way to them, but we know that it occurs as far north as Karwar” (*l.c.* 1896, 570). Mr. T. R. Bell “has seen a female laying eggs on a plant which is probably *Capparis tenera*. The eggs hatched out, but the larva failed to reach maturity” (J. As. Soc. Beng. 1900, 270). A male labelled “Nilgiris” is in Mr. P. Crowley’s Collection.

MIMICRY.—“This butterfly is a splendid mimic of the highly protected *Piccarda Eucharis*, but its more rapid and somewhat darting flight makes it easily distinguishable when on the wing” (L. de Nicéville, J. As. Soc. Beng. 1899, 210).

Of our illustrations on Plate 536, fig. 2, 2a, b, are from a Ceylon male and female, and fig. 2c, the *pupa*, copied from Mr. E. E. Green’s original drawing.

**PRIONERIS CLEMANTHE** (Plate 537, fig. 1, 1a, b, c, ♂, 1d, e, f, ♀).

*Pieris Clemanthe*, Doubleday, Ann. and Mag. Nat. Hist. 1846, p. 23.

*Prioneris Clemanthe*, Wallace, Trans. Ent. Soc. Lond. 1867, pp. 385-6, ♀. Butler, Proc. Zool. Soc.



- 1872, p. 28. Moore, Proc. Zool. Soc. 1878, p. 839; *id.* Journ. Linn. Soc. Zool. 1886, p. 50. Elwes, Journ. As. Soc. Beng, 1886, p. 433; *id.* Trans. Ent. Soc. Lond. 1888, p. 411. Swinhoe, *id. l.c.* 1893, p. 310. de Nicéville, Sikkim Gaz. 1894, p. 166. Fruhstorfer, Iris, 1902, p. 271.  
*Pieris Berenice*, Lucas, Rev. Zool. 1852, p. 324.  
*Pieris Helferi*, Felder, Reise Novara, Lep. ii. p. 161, pl. 25, fig. 10, 11 (1865).

IMAGO.—Male. Upperside greyish-white. *Forewing* with the veins basally slenderly black lined, the costal border and the outer veins more broadly black bordered, the upper veins slightly expanding obliquely before the apex and then outwardly dilating to the margin. *Hindwing* basally flushed with pale yellow; with the end of the outer veins and marginal edge slenderly black bordered, the submarginal line of the band on the underside being also sometimes indicated. Underside. *Forewing* white, with all the veins more broadly black bordered; three longitudinal slender black lines within the cell. *Hindwing* chrome-yellow, the outer border white, the precostal interspace bright crimson; veins black lined, the outer veins more or less submarginally expanded and then outwardly dilated, thus forming an ill-defined incomplete marginal band enclosing a series of white spots.

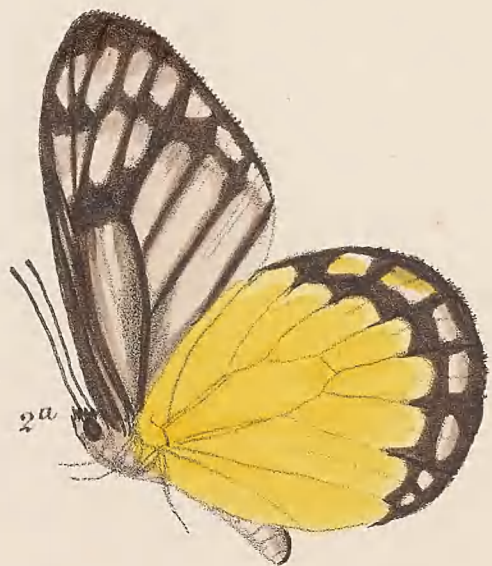
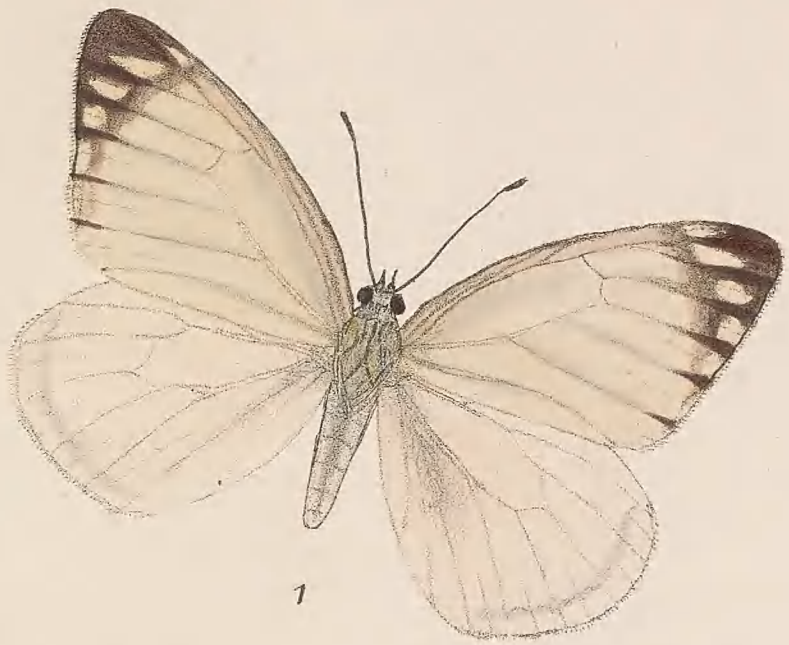
FEMALE. Upperside. *Forewing* black, with greyish-white scaled longitudinal apically dilated cell-streaks, a discal series of streaks and short submarginal streaks, the lower of the two latter being sometimes slightly coalescent. *Hindwing* white, basally flushed with pale yellow; the outer veins broader black lined than in the male, the marginal black border also broader and preceded by a more or less defined blackish-scaled submarginal slender lunular band, thus enclosing a series of greyish-white spots. Underside. *Forewing* black, with markings as on the upperside. *Hindwing* similar to the male.

Expanse, 3 to 3½ inches.

HABITAT.—Sikkim; Bhotan; Assam; Khasias; Burma; Tenasserim; Siam; Annam; Tonkin.

DISTRIBUTION.—Mr. H. J. Elwes records it as “occurring, but not commonly, in the lower valleys of Sikkim, from April to October, the female, however, seems quite rare” (Tr. Ent. Soc. 1888, 411). Mr. L. de Nicéville says it is “quite rare in Sikkim, and occurs from April to October at low elevations. In many years’ collecting, Mr. Otto Möller obtained two females only” (Sikk. Gaz. 1894, 166). Mr. G. C. Dudgeon obtained it in Bhotan. A male from Shillong, Assam, taken by Mr. J. P. Rawlins, is in the British Museum. Col. C. Swinhoe records it as “very common in the Khasias” (Tr. Ent. Soc. 1893, 310). In Burma it was obtained by Mr. O. Limborg at “Houngduran and Naththoung to Paboga, Upper Tenasserim” (P. Z. S. 1878, 839). Dr. J. Anderson took it in “Mergui, and on Elphinstone Island in March” (J. Linn. Soc. Z. 1886, 50). “Several males were taken in Tavoy, Ponsekai, and the Hills on the Siamese frontier” (Elwes, J. As. Soc.





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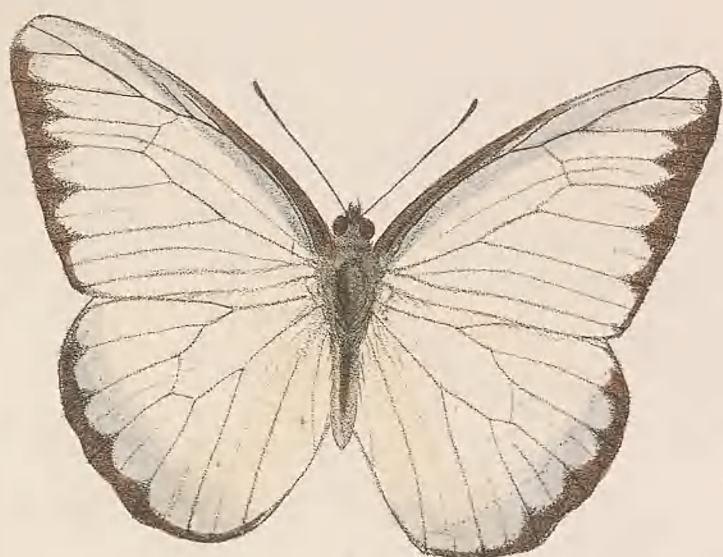








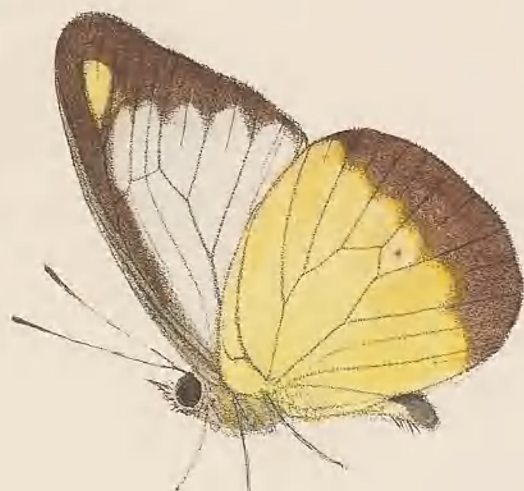




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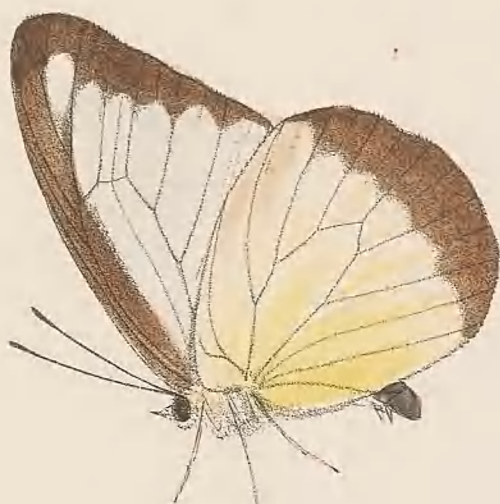
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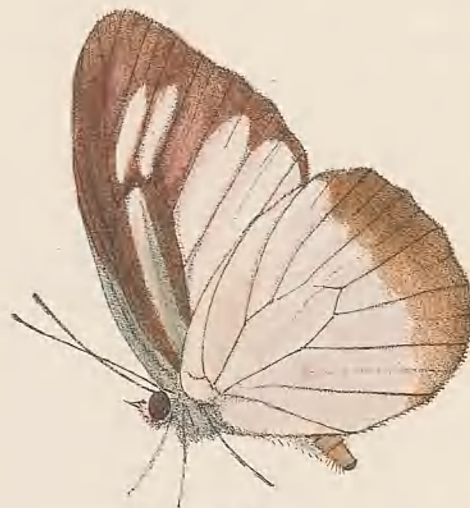
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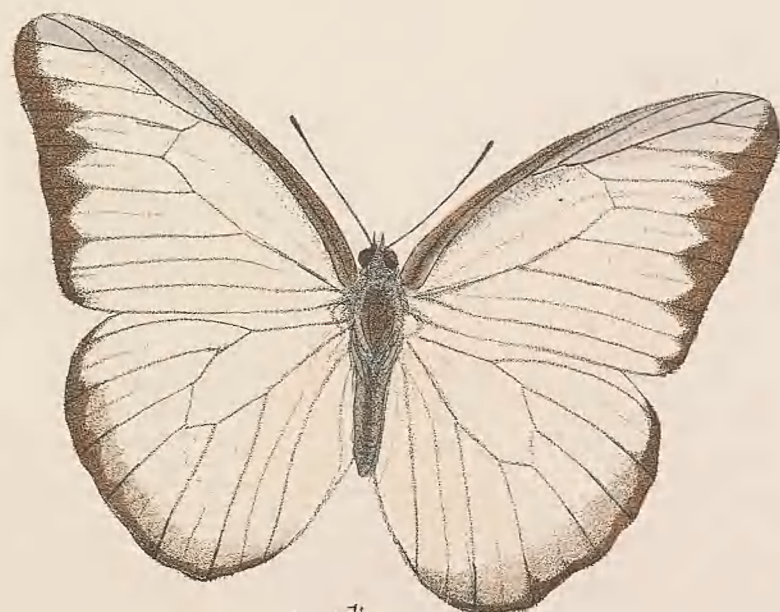
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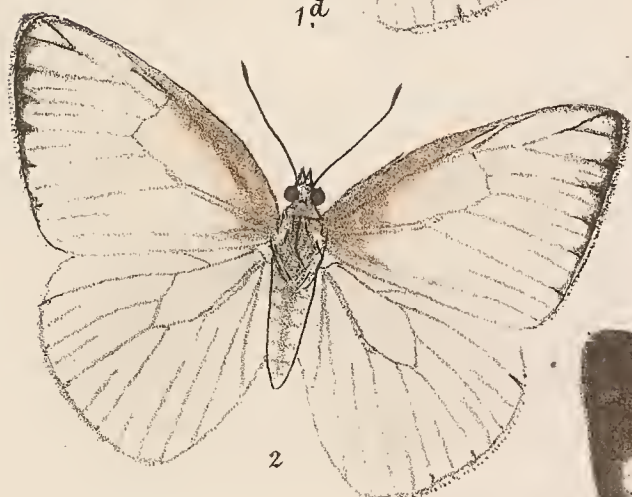
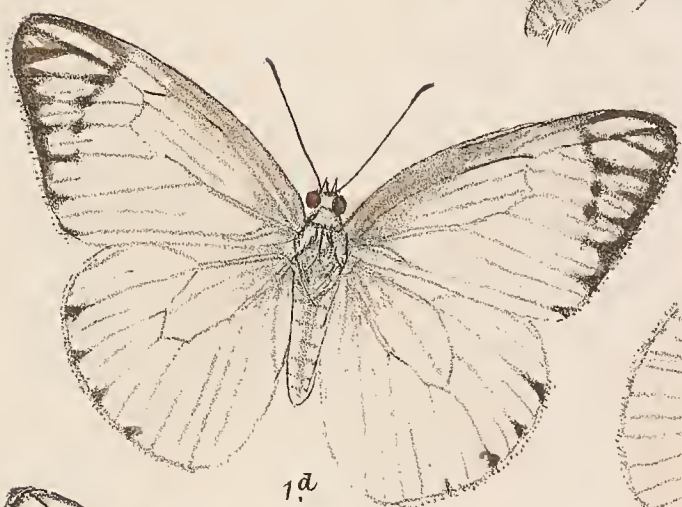
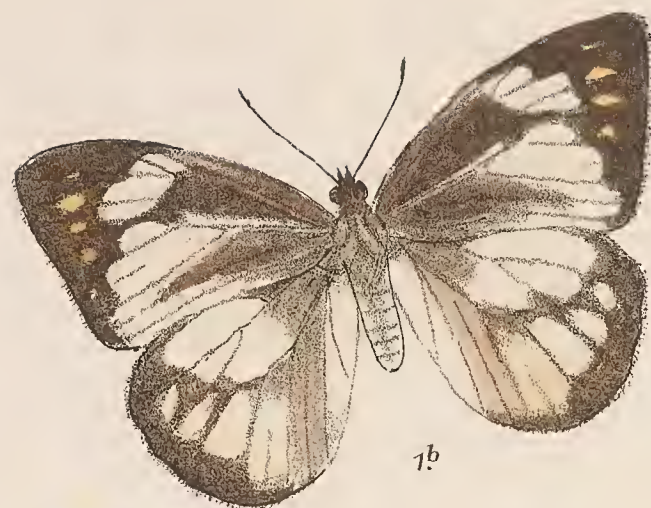
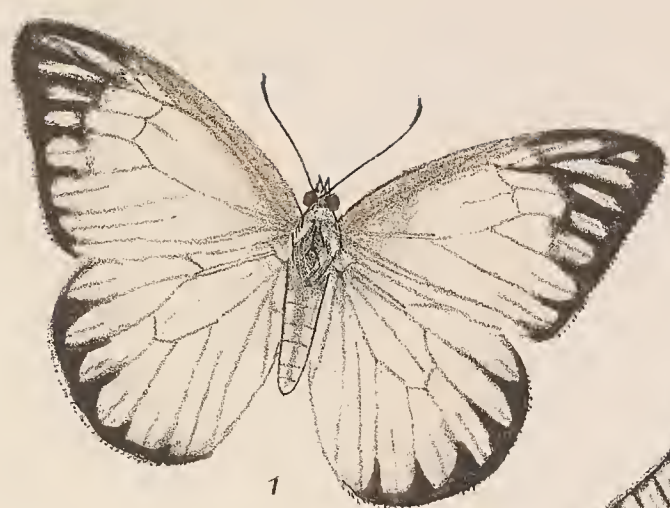
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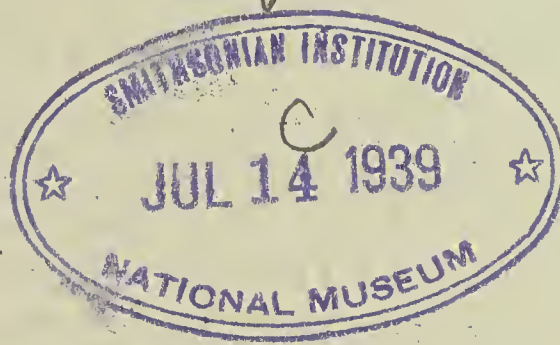
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Beng. 1886, 433). Col. C. H. E. Adamson took it in "Moulmein and Tenasserim, but not commonly, in February and March" (List, 1897, 41). Dr. L. Fea obtained it in the Karen Hills, in August. In the British Museum are specimens from the Thoungyeen Valley taken in January, and the Yoonzaleen Valley in November, by Col. C. T. Bingham; E. Pegu, March and April by Mr. W. Doherty, and a female from the S. Chin Hills, 7,000 feet, by Capt. E. Y. Watson.

It also occurs in Siam, Annam, and Tonkin.

INDO-MALAY SPECIES.—*Prioneris Malaccana* (*Prioneris Thestylis Malaccana*, Fruhstorfer, Berl. Ent. Zeit. 1899, p. 108; *id.* Soc. Ent. 1902, p. 81. *Habitat.* Perak.

*Prioneris Formosana*, Fruhstorfer, Berl. Ent. Zeit. 1903, p. 109, ♂. *Habitat.* Formosa.

*Prioneris Vollenhovii*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 386, ♂. Fruhstorfer, B. E. Z. 1899, p. 111. *Habitat.* Sarawak, Borneo.

*Prioneris Cornelia* (*Pieris Cornelia*, Vollenhoven, Mon. Pier. p. 5, pl. 2, fig. 2). Wallace, *l.c.* p. 386. Fruhst. *l.c.* 1899, p. 109. *Habitat.* Borneo.

*Prioneris Themana* (*Pr. Clemanthe subsp. Themana*, Fruhstorfer, Soc. Ent. 1903, p. 35. *Pr. Clemanthe*, Distant, Rhop. Malay. p. 295, pl. 24, fig. 16, ♂ (1885). Hagen, Iris, 1894, p. 36. de Nicéville, Journ. As. Soc. Beng. 1895, p. 489. Fruhst. B. E. Z. 1899, p. 109. *Habitat.* Sumatra; Malay Peninsula; Singapore.

*Prioneris Euclemanthe* (*Pr. C. Euclemanthe*, Fruhstorfer, Soc. Ent. 1903, p. 35. *Pr. Clemanthe*, Crowley, Proc. Zool. Soc. Lond. 1900, p. 508. *Habitat.* Hainan.

*Prioneris Philonome* (*Pieris Philonome*, Boisduval, Spéc. Gén. Léop. i. p. 453, ♂ (1836). Wallace, *l.c.* p. 387. Fruhst. *l.c.* 1899, p. 108. *Habitat.* Java.

*Prioneris Hypsipyle*, Weymer, Stett. Ent. Zeit. 1887, p. 12, pl. 1, fig. 1, ♂. de Nicéville, Journ. As. Soc. Bengal, 1895, p. 489. Fruhst. *l.c.* 1899, p. 106. *Habitat.* Sumatra.

*Prioneris Autothisbe* (*Delias Autothisbe*, Hübner, Samm. Exot. Schmett. ii. pl. 123 (1816-23). Wallace, *l.c.* p. 387. Fruhst. *l.c.* 1899, p. 106. *Pieris Auto.* Boisd. *l.c.* p. 452 (1836). Vollenhoven, *l.c.* p. 20, pl. 3, fig. 5, ♀ (1865). *Habitat.* Java.

*Prioneris Orientalis* (*Pr. Autothisbe subsp. Orientalis*, Fruhstorfer, Soc. Ent. 1903, p. 35. *Habitat.* E. Java.

#### Genus APPIAS.

*Appias*, Hübner, Verz. bek. Schmett. p. 91 (1816). Butler, Cistula Entom. i. pp. 37, 49 (1870). *id.* Ann. Nat. Hist. 1898, p. 392. Moore, Lep. Ceylon, i. p. 134 (1881). Kirby, Allen's Nat. Libr. Butt. ii. p. 172 (1896).

*Appias* (pt.), Distant, Rhop. Malay. p. 310 (1885). Watson, Journ. Bombay N. H. Soc. 1894, p. 497. VOL. VI.—April 17th, 1905.



IMAGO.—Male. *Forewing* triangular, less so in the female; apex obtuse, costal vein extending to two-thirds the margin; subcostal vein four branched, first branch emitted at one-fourth and second at one-eighth before end of the cell, third bifid at one-third before the apex; upper radial emitted at one-fourth beyond the cell; upper discocellular obliquely-concave, lower straight, the lower radial from their angle; cell more than half length of the wing; middle median at one-fourth, lower at more than half before end of the cell; submedian vein waved. *Hindwing* short, broadly-oval; exterior margin convex hindward; precostal vein nearly straight; costal vein curved; first subcostal at one-third before end of the cell; upper discocellular very oblique, lower less oblique, radial from their angle; cell broad; middle median at one-fifth and lower at near half before end of the cell; submedian vein straight, internal recurved. *Body* moderate; thorax stout, hairy; palpi porrect, hairy beneath, second joint extending half beyond the head, third joint long, slender; antennæ with a lengthened spatular club. Anal valves of male elongated, provided with a tuft of long rigid hairs on each side of the base beneath.

LARVA [Libythea].—Cylindrical, slightly tapering at each end; anal segment slightly bifid.

PUPA.—Head with a short frontal snout; a thoracic dorsal acute prominence, a medial-abdominal lateral angular-process on each side.

TYPE.—A. *Zelmira*.

SEASONAL VARIATION, ETC.—“This is shown in the *rainy-season* forms being larger and more profusely marked than the *dry-season* ones. The latter also having the ground-colour of the underside tinged with ochreous instead of being pure white. *A. Zelmira* is a species which shows the transition from the extreme of one form to the extreme of the other more clearly than any other species known to me, and it is by no means difficult to obtain a series of males showing every stage from one extreme—with all the veins on the underside of the hindwing broadly black, to the other extreme—in which the whole hindwing is of a uniform, slightly ochreous tint, the only marking being a few greyish scales across the end of the cell.” (Watson, J. Bombay N. H. S. 1894, 497.)

#### APPIAS HIPPOIDES.

*Appias Hippoides*, Moore, Trans. Ent. Soc. Lond. 1881, p. 312, *id.* Journ. Linn. Soc. Zool. 1886, p. 49. de Nicéville, Journ. As. Soc. Bengal, 1885, p. 51; *id.* *l.c.* 1886, p. 372. Taylor, List Butt. of Orissa, p. 15 (1888). Doherty, Journ. As. Soc. Beng. 1889, p. 120. de Nicéville, Sikkim Gazetteer, 1894, p. 169. Adamson, List Butt. of Burm. p. 43 (1897).

*Tachyris Hippoides*, Elwes, Trans. Ent. Soc. 1888, p. 418.

*Catophaga Hippoides*, Watson, Journ. Bombay N. H. Soc. 1894, p. 501.



*Pieris Hippo* (pt.), Moore, Catal. Lep. Mus. E. I. C. i. p. 71 (1857). Wallace, Tr. Ent. Soc. 1867, p. 366.

*Tachyris Hippo*, Manders, Tr. Ent. Soc. 1890, p. 534.

*Appias Hippo*, Watson, Journ. Bombay N. H. Soc. 1897, p. 670.

*Tachyris Lynceida Hippo* (pt.), Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 288.

*Wet-season Brood* (Plate 540, fig. 1, 1a, ♂, 1b, c, ♀).

Male. Upperside greyish-white. *Forewing* with the subcostal branches finely black-lined, the costal-margin and borders of the apical-veinlets bluish-grey scaled; an exterior-marginal black narrow dentated band. *Hindwing* with a similar marginal narrow black dentate band, which is inwardly broadly bordered by bluish-grey scales. Underside. *Forewing* greyish-white, with a broad cuprescent-brown costal band and a continuous exterior-marginal band, the latter being broader than on the upperside; a subapical prominent gamboge-yellow and a similar minute spot either above or below it. *Hindwing* gamboge-yellow, with a broad exterior marginal cuprescent-brown band—the inner edge of which is sinuated.

Female. Upperside dark sepia-brown. *Forewing* with two upper and two lower discal greyish-white longitudinal streaks, and generally an intermediate more or less obscurely-defined medial-discal streak, the lower discal streak being bifid externally; and also an obsolescent streak extending inward from apex of the cell. *Hindwing* with the base and lower-discal area to the submedian vein pale sullied greyish-brown, the anterior-discal area between the veins, the outer portion of the cell, and the abdominal margin greyish-white streaked, these streaks extending pointedly outward into the marginal band. Underside. *Forewing* paler brown, with the cell-streak, two upper and three lower discal broad streaks and the posterior margin greyish-white, the apex also being very slightly sullied-white streaked. *Hindwing* yellow, the disc sometimes whitish; the veins brown-lined; the cuprescent-brown exterior marginal band broader than in male.

Expanse, ♂  $2\frac{8}{10}$ , ♀  $2\frac{4}{10}$  to  $2\frac{8}{10}$  inches.

*Intermediate Wet Brood* (Plate 540, fig. 1d, e ♂, 1f, g ♀).

Male. Upperside similar to *wet form*. Underside. *Forewing* also similar, except that the costal and outer band is paler, and the apical spot is white. *Hindwing* much paler yellow, the outer marginal band somewhat narrower and paler.

Female. Upperside paler sepia-brown than in *wet form*. *Forewing* with the discal white streaks less prominent, the cell-streak obsolete. *Hindwing* with the discal streaks less defined. Underside. *Forewing* paler sepia-brown than in *wet form*, the cell-streak and discal streaks less prominent. *Hindwing* greyish-white, the veins brown-lined but less defined, the marginal band paler.

Expanse, ♂  $2\frac{6}{10}$  to  $2\frac{8}{10}$ , ♀  $2\frac{8}{10}$  inches.



*Dry-season Brood* (Plate 541, fig. 1, 1a, ♂, 1b, c, ♀).

*Appias Vacans*, Butler, Trans. Ent. Soc. Lond. 1870, p. 490, ♀. *id.* Lep. Exotica, p. 90, pl. 34, fig. 5, 6, ♀ (1872). Moore, Proc. Zool. Soc. 1878, p. 839; *id.* Journ. Linn. Soc. Zool. 1886, p. 49.

*Appias Epicæna*, Swinhoe, Proc. Zool. Soc. 1889, p. 398, ♂ ♀.

Male. Smaller than *wet-season* form. Upperside similar, except that on the *hindwing* the marginal black band is narrower and less sinuous and its submarginal grey border also less apparent. Underside. *Forewing* similar to the *wet-season* form. *Hindwing* yellow, generally of a deeper tint; the marginal band much narrower, usually about half the width of the wet form.

Female. Also smaller than the *wet* form. Upperside. *Forewing* with two upper and three lower-discal broader greyish-white streaks, the posterior margin also being white-streaked. *Hindwing* greyish-white, slightly flushed with very pale yellow, the dark outer band restricted to the margin. Underside. *Forewing* with broader white areas. *Hindwing* uniformly yellow, including the veins, the marginal band much narrower than in the wet form.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{4}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{6}{10}$  inches.

*Extreme Dry-season* (typical *vacans*, Butler). Male. Upperside similar to the ordinary dry form. Underside. *Forewing* with white apical spot. *Hindwing* uniformly paler yellow than in ordinary dry form, the marginal band narrow.

Female. Upperside. *Forewing* with the black band restricted to the costal border and exterior margin, and on the latter not reaching the cell along the upper median veinlet. *Hindwing* with the black marginal band narrower than in ordinary dry form. Underside. *Forewing* with the costal and exterior band restricted as on the upperside, but paler. *Hindwing* uniformly pale or clear yellow; the band narrower than in ordinary dry form.

Expanse, ♂  $2\frac{4}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

HABITAT.—N.E. India; Burma; Tenasserim; Siam; Tonkin.

DISTRIBUTION, HABITS, ETC.—Mr. W. C. Taylor records it as being “common in some localities in Orissa, Lower Bengal” (List, 1888, 15). Mr. L. de Nicéville “captured a single male in a garden at Sealdah near Calcutta, in November” (J. As. Soc. Beng. 1885, 51). Col. C. Swinhoe has both sexes of the dry-season form from Maldah, Upper Bengal, taken by Mr. N. Irvine, and which he has described as *A. Epicæna*. Mr. W. Doherty, in his “Notes on Assam Butterflies” (Journ. As. Soc. Bengal, 1889, 120), writes, “The normal form of the female, of *Appias Hippoides*, is dark above and below, and but slightly clouded with whitish and dirty yellow. It was usually taken in the forest, moving slowly about in the deep shade, or lying *perdue* among the leaves. The other was almost as brightly coloured with



pure white and rich yellow as the male, differing chiefly in the absence of the subapical yellow spot on the forewing below. Like the male it was always flitting up and down the sunny paths at the edges of the wood, only alighting from time to time for a moment or two. Intermediate specimens occurred, and there was no possibility that the species could be different; but the forms were so unlike that they might almost claim to be called dimorphic." Mr. H. J. Elwes records it as "very common in Sikkim at low elevations, from 2,000 to 5,000 feet, from March to November" (Tr. Ent. Soc. 1888, 418). Mr. L. de Nicéville says it is "one of the commonest butterflies in Sikkim, at low elevations, and flies from March to December" (Sikk. Gaz. 1894, 169). Of the *wet-season* form we possess specimens from Manipur, taken by Dr. G. Watt; Nowgong, Assam (Mrs. Span); Cachar, taken in June; Sikkim and Bhotan (G. C. Dudgeon); Nepal (Gen. G. Ramsay); Bassein, Burma, April; Chittagong, October; Moulmein (W. S. Atkinson); Bhamo, November (Dr. L. Fea); and of the *dry-season* form (*Vacans*) both sexes from Sikkim; males from Chittagong, Burma, taken in January; Moulmein, January; a Bhamo female, November (Dr. L. Fea); Chindwin, December; Col. C. H. E. Adamson took it at Mogoung, Burma, in January; Dr. J. Anderson obtained it in "Mergui, December; Thaing and King Islands in February" (J. Linn. Soc. Zool. 1886, 49). In the British Museum are specimens of the *wet-season* form from Jorehat, June, Shillong and Sibsagar, Assam; Manipur; Bhamo, Pegu, Moulmein, Burma; and of the *dry-season* form (*Vacans*) from Maldah, Upper Bengal; Modah, Irriwaddy, Burma, March; Toungoo, March. Dr. N. Manders records "both sexes of the *wet-season* form from Sawlon, but was not taken in the Shan States" (Tr. Ent. Soc. 1890, 534). Col. Adamson records the sexes of both forms as "exceedingly common in Burma" (List, 1897, 43). Mr. J. Wood-Mason records "both sexes numerous in forests, in Cachar, from April to September" (J. As. Soc. Bengal, 1886, 372).

The allied species "*Hippo*, Cramer, in Sumatra," write Mr. L. de Nicéville and Dr. L. Martin, "is a constant species, and does not exhibit the great seasonal dimorphism which is found in the Indian forms. It is found throughout the year, but only in or near the forest. The males often assemble twenty or thirty together on a small puddle on the road, the female is found in the forest hunting for flowers for herself, or for the food-plant of her larva. Dr. Martin has often seen them on the same flower that is frequented by the female of *Udaiana Cynis*. He has bred the butterfly from the larvæ found feeding on a small shrub called by the Battaks 'Daoen Tangla,' which grows on the banks of rivers. The larva superficially does not greatly differ from the larvæ of the *Catopsilias*, but in shape is more slender. The pupa, however, is quite different, with a stellar indented thorax. The imago emerges in seven days" (J. As. Soc. Beng. 1895, 501).



## APPIAS NICOBARICA.

Male. Upperside similar to *A. Hippoides*. *Forewing* with the inner edge of the marginal dentated black band distinctly grey-scaled. *Hindwing* with the marginal black band very narrow and almost even, the submarginal grey bordering broader and more distinctly defined. Underside. Similar to wet-season form of *Hippoides*. *Hindwing* clear gamboge-yellow, with the outer marginal band less sinuated on its inner edge.

Female. Upperside. *Forewing* with two upper and three lower-discal greyish-white streaks. *Hindwing* paler, being more uniformly sullied throughout with very pale greyish-brown scales. Underside similar to dry-season form of *Hippoides*, the hindwing being greyish-white.

Expanse, ♂ ♀  $2\frac{6}{10}$  inches.

HABITAT — Nicobars.

Described from specimens received by Col. C. T. Bingham.

## APPIAS TAPROBANA.

*Wet-season Brood.* (Plate 541, fig. 2, 2a, ♂, 2 b, c, ♀.)

*Appias Taprobana*, Moore, Proc. Zool. Soc. Lond. 1879, p. 143; *id.* Lep. of Ceylon, i. p. 135, pl. 52, fig. 1, 1a, b, c ♂ ♀, and larva and pupa (1881). de Nicéville, Journ. As. Soc. Bengal, 1899, p. 218.

WET-SEASON BROOD. Male. Upperside similar to wet-season *Hippoides*. *Forewing* with the black dentated exterior marginal band comparatively broader, the black scales distinctly extending along the lower subcostals, and thus forming the lower intervening white portion into an insulated spot. *Hindwing* also with a broader black dentated marginal band and distinctly darker grey-scaled inner border. Underside. *Forewing* with cuprescent-brown costal and dentated exterior band, the point on the latter at the upper-median extending slightly along the veinlet to the base of middle median within the cell; apical spot yellow. *Hindwing* bright yellow; the costal and subcostals slenderly lined with brown scales; exterior band broad, cuprescent-brown, with a sinuous inner edge.

Female. Upperside dark sepia-brown. *Forewing* with two upper and three lower discal longitudinal greyish-white streaks, the middle streak being less defined, a more or less ill-defined streak extending within the cell from its apex. *Hindwing* with the basal area greyish-white, merging into the broad dark marginal dentated band, the costal vein and subcostals brown lined. Underside similar to same sex of wet-season *Hippoides*. *Forewing* with broader white cell and discal streaks. *Hindwing* yellow; the veins brown lined, marginal sinuous-edged band broad.



## DRY-SEASON BROOD.

*Appias vacans*, Moore, Lep. of Ceylon, i. p. 135, pl. 52, fig. 2, 2a ♂ (1881).

*Appias Aperta*, Butler, Ann. Nat. Hist. 1886, p. 188. Moore, Lep. Ceylon, iii. p. 532 (1887).

Male. Upperside similar to wet-season; marginal band on the hindwing somewhat narrower. Underside. *Forewing* with white or pale yellow apical spot. *Hindwing* paler yellow, including the veins; marginal band narrower.

Expanse, ♂  $2\frac{4}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

LARVA.—Cylindrical, dark green, minutely black-dotted; a whitish sublateral line; beneath pale green.

PUPA.—Pale pinkish olivescient-green; head acutely pointed in front, thorax and anterior abdominal segments dorsally angulated; wing-cases also angled laterally.

HABITAT.—Ceylon.

DISTRIBUTION.—“Found in the low country, generally in the months of September to December. Larva feeds on *Cratæva religiosa*” (F. M. Mackwood). Capt. Hutchinson obtained it at “Colombo; in open waste ground from October to end of the year. Flight quick; alights on shrubs. Shy, but when driven off generally returns to the same spot. Only appeared one year, and then tolerably plentiful” (Lep. Ceylon, i. 135).

## APPIAS LATIFASCIATA.

(Plate 541, fig. 3, 3a, ♂, 3b, ♀ (*wet form*)).

*Appias latifasciata*, Moore, Trans. Ent. Soc. Lond. 1881, p. 312, ♂ ♀.

*Catophaga latifasciata*, Watson, Journ. Bombay Nat. Hist. Soc. 1894, p. 501.

*Appias vacans*, Hampson, Journ. As. Soc. Beng. 1888, p. 362. Ferguson, Journ. Bombay N. H. Soc. 1891, p. 444.

*Catophaga Hippo*, Watson, J. Bombay N. H. Soc. 1890, p. 8, ♀ (*dry form*).

*Appias (Catophaga) Hippoides*, Davidson and Aitken, Journ. Bombay N. H. Soc. 1897.

*Appias Taprobana*, de Nicéville, Journ. As. Soc. Bengal, 1900, p. 254.

IMAGO.—Male. Larger than *A. Taprobana*. Upperside with similar broad black outer marginal dentated band. Underside also similar. *Forewing* with the apical spot yellow in the wet-season form, white in the dry-season. *Hindwing* deep yellow in wet form, paler in the dry form, exterior marginal band broader, costal and subcostal vein densely brown-scaled, these brown scales also broadly bordering the subcostal and its branches from their base, thus forming a prominent fascia; the discal interspaces between the subcostal and radial being more or less whitish.

Female. Upperside fuliginous-black. *Forewing* with slightly-defined whitish cell-streak, two white upper-discal streaks and entire lower-discal area or lower discal streaks. *Hindwing* with olivescient yellowish-white basal area, and broad fuliginous-black sinuous marginal band. Underside fuliginous-brown. *Forewing* similar to



upperside. *Hindwing* yellow; costal and subcostals brown lined; marginal band broad, its inner edge deeply sinuous.

Expanse, ♂  $2\frac{8}{10}$ , ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

HABITAT.—South India.

DISTRIBUTION, HABITS, LARVA.—We possess males from Kanara, taken by the late Mr. S. N. Ward. Col. C. Swinhoe has both sexes from Karwar. Messrs. Davidson and Aitken record it as being “found in the forests on the slopes and crest of the Ghâts, and is common, but seems to come out more during the rainy-season. We have bred it from December to May, on the Caper (*Crataevia religiosa*). The eggs are laid in clusters. The larva and pupa are not very different from *A. Libythea*, the pupa may be distinguished from it by the second segment being produced laterally into a tongue-like process, which embraces the shoulder” (J. Bombay N. H. S. 1896, 574). Mr. G. F. Hampson found it “rare in the Nilgiris, at from 1,000 to 3,000 feet elevation” (*l.c.* p. 362). Mr. H. S. Ferguson records it as “not uncommon in the low country of Travancore from April to August. Rare in the Hills, 2,000 to 4,000 feet (*l.c.* p. 444). Capt. E. Y. Watson obtained a female, probably of a dry-season form, at “Kathlekan, Madras, in December” (*l.c.* 1890, p. 8). In the British Museum are specimens from the Nilgiris; Borsippa Falls, September (Watson); Malabar (*ex* Coll. P. Crowley); and Trevandrum, Travancore.

Of our illustrations on Plate 541, fig. 3, 3a are from a Malabar male, and 3b from a Karwar female.

#### APPIAS ZELMIRA.

*Wet-season Brood* (Plate 542, fig. 1, 1a, ♂, 1, b, c, ♀).

*Papilio Zelmira*, Cramer, Pap. Exot. iv. pl. 320, fig. C. D. ♀ (1782).—*nec* fig. E. F.)

*Appias Zelmira*, Hübner, Verz. bek. Schmett. p. 91 (1816). Butler, Cistula Ent. i. p. 49 (1870); *id.* Ann. Nat. Hist. 1898, p. 392. Moore, Proc. Zool. Soc. 1878, p. 839; *id.* Journ. Linn. Soc. Zool. 1886, p. 49. de Nicéville, Journ. As. Soc. Beng. 1885, p. 50; *id.* 1886, pp. 372—432. Swinhoe, Trans. Ent. Soc. 1893, p. 309. Watson, Journ. Bombay N. H. Soc. 1894, p. 497-8, pl. 2, fig. 1—5, ♂; *id.* *l.c.* 1897, p. 670. Kirby, Allen's Nat. Libr. Butt. ii. p. 173 (1896). Adamson, List Burm. Butt. 1897, p. 44.

*Pieris Zelmira*, Boisduval, Spéc. Gen. Lep. i. p. 533, ♀ (1836).

*Tachyris Zelmira*, Butler, Catal. Fabr. Lep. B. M. p. 210 (1869). Kirby, Syn. Catal. D. Lep. p. 465 (1871).

*Pieris Nerissa*, Boisduval, Spéc. Gen. Lep. i. p. 535 (1836), *nec* Fabricius.

*Tachyris Nerissa*, Wallace, Tr. Ent. Soc. 1867, p. 364.

*Appias Libythea* (pt.), Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 293; *id.* Soc. Ent. 1903, pp. 26, 41.

*Appias Libythea*, de Nicéville, Sikkim Gazetteer, 1894, p. 169.



## WET-SEASON BROOD (Plate 542, fig. 1, 1a ♂, 1b, c ♀).

Male. Upperside greyish-white. *Forewing* with the costal border sprinkled with grey scales; a prominent black exterior marginal decreasing dentated band, the black extending along the subcostals, radials, and upper and middle medians, on each of which it dilates, and thus forms a more or less incomplete excurved subapical fascia enclosing the apical white elongated streaks. *Hindwing* with a prominent black exterior marginal dentated band, the inner points of which are each prolonged acutely for some distance along the veins; the subcostal and medial fascia of the underside being slightly visible. Underside greyish-white. *Forewing* with similar but much less prominent marginal band, the vein portions being more narrowly lined. *Hindwing* with all the veins—except the base of the median, upper discocellular, and base of radial, and entire lower submedian—distinctly black lined, each vein also being slightly edged on both sides with blackish scales, these scales being more broadly sprinkled along the subcostal from its base to apex; a black scaled speckled-fascia also extends across the middle of the wing from lower subcostal to the submedian vein.

Female. Upperside fuliginous greyish-black. *Forewing* with a sullied or greyish-white broad subapical oblique patch, a discal patch extending pointedly inward below the cell towards the base, sinuously outwards to posterior angle and then for some distance below the submedian; also four or five apical more or less distinct white small narrow ovate spots. *Hindwing* with a white upper-discal broad patch extending from the subcostal across outer half of the cell, and a lower-discal series of spots increasing in size posteriorly and obsolescent anally. Underside with similar but much less-defined markings as on upperside. *Forewing* with the dark portions much paler, being either fuliginous or dark fuliginous-grey, the apical area more or less olivescence-yellow tinged, and the spots more or less obsolescent, the cell-area also either dark grey or olivescence tinted. *Hindwing* with the dark portions, as on upperside, much less defined, and of a more or less olivescence-yellow tint, the base of the costa being bright yellow.

Expanse, ♂ ♀  $2\frac{4}{10}$  to  $2\frac{6}{10}$  inches.

## INTERMEDIATE FORM (Plate 542, fig. 1d, e ♂, 1f ♀).

*Appias Olferna*, Swinhoe, Ann. Nat. Hist. 1890, p. 358, ♂ ♀.

Male. Upperside. *Forewing* with similar but somewhat narrower, and much paler defined outer marginal markings than in the wet-form. *Hindwing* also with very slightly-defined or obsolescent outer-marginal vein-points. Underside. *Forewing* white, the apical area very faintly flushed with pale yellow; marginal markings either obsolescent or obsolete. *Hindwing* almost white or very faintly flushed with



pale yellow; base of costa pale yellow; veins not lined, the subcostal and medial fasciæ only being very slightly apparent.

Female. Upperside similar to same sex of wet form, but with the dark markings less prominent, the white portions being either clear or faintly flushed with very pale yellow. Underside with paler and much less defined markings than in wet form. *Forewing* with paler yellowish-tinted apex. *Hindwing* with the veins clear or obsolescently lined, the subcostal and medial fascia slightly apparent, the costal and outer border and medial fascia paler than in wet form; base of costal edge bright yellow.

Expanse, ♂ ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

DRY-SEASON BROOD.

*Appias Irvinii*, Swinhoe, Ann. Nat. Hist. 1890, p. 359, ♂ ♀.

Upperside. *Forewing* with the black outer marginal band showing a much less-defined series of white streaks, which are either slender or obsolescent. *Hindwing* with very slightly-defined outer marginal vein-points. Underside. *Forewing* with the apical area very faintly yellow tinged, the inner-edge of the marginal band being very obscurely indicated. *Hindwing* very faintly yellow tinged, the medial fascia only being very slightly indicated.

Female. Upperside. *Forewing* with somewhat narrower black markings than in the intermediate form; the connection from the cell to the outer band much narrower, and in some almost obsolete, the white slender streaks on the outer band less defined or obsolescent. *Hindwing* with an outer-marginal row of blackish spots of more or less small size, and a few dusky scales very faintly indicating the discal fascia, or in specimens of the *extreme dry form*, this wing is entirely unmarked. Underside. *Forewing* with similar but paler-defined markings as in the intermediate form, the connecting streak from the cell narrower, the apex tinged with very pale yellow. *Hindwing* as in the male.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{4}{10}$ , ♀ 2 to  $2\frac{4}{10}$  inches.

HABITAT.—Upper and Lower Bengal; Assam; Lower Sikkim; Burma; Tenasserim; Siam; Tonkin.

DISTRIBUTION.—Cramer gives “Coromandel” for the locality of his *Zelmira*, fig. C, D, which is doubtless erroneous, as our present species does not occur so far south. Mr. L. de Nicéville (J. As. Soc. Bengal, 1885, p. 50) writes, “I have seen a single male specimen of *Zelmira* taken in Calcutta.” Mr. W. S. Atkinson, in his MS. Notes, says it is “common in the plains of Bengal. Also taken at Dacca and Silhet.” Col. C. Swinhoe’s types of *Olferna* and *Irvinii* were both taken at Maldah, Upper Bengal, by Mr. N. Irvine, in March, April, and May—which we have verified by the type labels and reference to the describer’s register. Col. Swinhoe records it



as being "common in the Khasia Hills" (Tr. Ent. Soc. 1893, 309). Mr. L. de Nicéville records it (as *A. Libythea*) from Sikkim, as "occurring rather rarely at 2,000 feet elevation, in May" (Sikk. Gaz. 1894, 169). In Burma, according to the observations made by Col. C. H. E. Adamson, "the form *Zelmira* appears in the rainy-season and changes imperceptibly, as the cold and dry seasons follow each other, into the form known as *Irvini*. In my series of many males and females, although I have extreme forms of each variety, yet it is quite impossible to divide the two when a large number are seen together. I have also taken undoubted males of *Zelmira* in *coitû* with both varieties of females. The insect is common in Upper Burma from October to April" (List Burm. Butt. 1897, 44). Capt. E. Y. Watson obtained it during the Chin-Lushai Exped. of 1889-90 at "Pauk, in September and October, at Pokoko, in September, and at Tilin, in December. Very common" (J. Bombay N. H. Soc. 1891, 53). Capt. E. Y. Watson took the "wet form (his fig. 1) at Pokoko, Upper Burma, in October, the intermediate form (his figs. 2 and 3) in the Upper Chindwin District, Upper Burma, in May, and the dry form (his fig. 4) in the Yaw District, Upper Burma, in January, and (fig. 5) in Toungoo, Lower Burma, in January" (J. Bombay N. H. Soc. 1894, 498). Mr. O. Limborg captured it on the road from Moulmein to Meetan, Upper Tenasserim" (P. Z. S. 1878, 839). Mr. L. de Nicéville records it from Ponekai, and the Hills on the Siamese frontier" (J. As. Soc. Beng. 1886, 432). Dr. J. Anderson obtained it on "Elphinstone Island, Mergui, in March" (J. Linn. Soc. Zool. 1886, 49).

We possess a specimen of both sexes from Bauleah near Calcutta, from Mr. A. Grote's collection; males from Assam, Sikkim, both sexes from Burma and Tenasserim.

#### APPIAS LIBYTHEA.

- Papilio Libythea*, Fabricius, Syst. Ent. p. 471 (1775); Spec. Ins. p. 41 (1781); Mant. Ins. p. 19 (1787). Ent. Syst. iii. 1, p. 190; ♀ (1793). Jones, Icones, pl. 54, fig. 2 ♀. Donovan, Ins. India, pl. 27, fig. 3, ♀ (1800).
- Pieris Libythea*, Doubleday and Hewitson, Gen. D. Lep. p. 46 (1847). Moore, Proc. Zool. Soc. 1865, p. 759.
- Tachyris Libythea*, Butler, Catal. Fabr. Lep. B. M. p. 210 (1869). Kirby, Syn. Catal. D. Lep. p. 465 (1871).
- Appias Libythea*, Moore, Lep. of Ceylon, i. p. 134, pl. 52, fig. 3, 3a ♂ ♀ (1881). Swinhoe, Proc. Zool. Soc. 1885, p. 138, *id.* 1886, p. 431. Hampson, J. As. Soc. Beng. 1888, p. 362. Davidson and Aitken, Journ. Bombay N. H. Soc. 1890, p. 258; *id.* 1896, p. 573. Taylor, Butt. of Orissa, 1888, p. 16. de Nicéville, Journ. Bombay N. H. Soc. 1898, p. 591; *id.* J. As. Soc. Beng. 1900, p. 254; *id. l.c.* 1899, p. 218. Watson, J. As. Soc. Beng. 1890, p. 268; *id.* J. Bombay N. H. Soc. 1894, pp. 497-8.
- Appias Libythea* (pt.), Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 293; *id.* Soc. Ent. 1903, p. 26
- Papilio Zelima*, Cramer, Pap. Exot. iv. pl. 320, fig. E. F. ♀ (*nec* fig. C. D.).



*Pieris Libitina*, Godart, Enc. Méth. ix, p. 133 (1819). Boisduval, Spéc. Gen. Lep. p. 499 (1836).

*Pieris Rouxii*, Boisd. Spéc. Gen. Lep. p. 481, ♂ (1836).

*Appias retexta*, Swinhoe, Ann. Nat. Hist. 1890, p. 360, ♂ ♀.

*Wet-season Brood* (Plate 542, fig. 2 ♂, 2a, b ♀).

IMAGO.—Male. Upperside greyish-white. *Forewing* with black costal edge, and grey-black scaled irrorated basal costal border; a black-scaled very narrow exterior marginal dentated band decreasing from the subcostal to the submedian. *Hindwing* with very small indistinct blackish-scaled marginal vein-points, which are obsolete in some specimens that probably emerged near the dry season. Underside white. *Forewing* with the costal and outer edge slightly blackish; a few greyish-black scales along the base of costa. *Hindwing* unmarked.

Female. Upperside greyish-white. *Forewing* with greyish-black costal edge, a broad longitudinal band from base of the costa and filling up the cell—with the exception of a thin streak above the median vein, this black cell-band more or less thinly extends along the upper median veinlet and joins a broad outer-marginal decreasing band extending sinuously from before the apex to posterior angle, enclosing the white subapical oblique quadrate patch, the outer band showing faint traces of paler intervening streaks; a less intense greyish-black fascia extends pointedly outward from below the cell to the disc in extreme wet-season specimens. *Hindwing* with a greyish-black marginal macular band composed of large confluent spots, or, of more or less slightly separated spots paling diffusedly to the anal angle, and connected by similar coloured scales along the veins from the lower subcostal to a discal curved paler fascia, which latter becomes obsolete posteriorly. Underside white. Both wings with dark-grey similar disposed markings. *Forewing* with the outer band traversed by white interspaced streaks, or this band is white and its inner edge only defined by dark grey. *Hindwing* with the outer-marginal macular band indistinct or obsolescent; base of costa pale yellow. Some *intermediate* specimens of this sex (Plate 542, fig. 2a)—which agree with the Fabrician *type* specimens of *Libythea*—emerged probably near the dry season, vary on the upperside, in the *forewing*, in the connecting black streak along the upper-median to the outer band, and also the lower basal fascia, being either obsolescent or obsolete, and in the *hindwing*, the marginal spots are smaller and more or less well separated, the discal fascia with its connecting veins is also obsolescent or more generally entirely absent. On the underside, the markings are much less defined; on the *forewing* the outer band is very faintly indicated by the greyish inner-edge, the apical area being entirely white or very faintly tinged with pale yellow, and on the *hindwing* the ground-colour is either white or very faintly tinged with pale yellow, the discal fascia being faintly indicated, and the marginal spots absent.

Expanse, ♂ ♀ 2 to 2 $\frac{4}{10}$  inches.



*Dry-season Brood* (Plate 542, fig. 3 ♂, 3a, b ♀).

*Appias Ares*, Swinhoe, Proc. Zool. Soc. 1885, p. 138, ♂ ♀.

Male. Upperside. *Forewing* with a diffused broader grey-black scaled outer-marginal band. *Hindwing* unmarked. Underside with the apical area of forewing, and entire hindwing tinted with very pale yellow.

Female. Upperside. *Forewing* with the cell-band and the marginal band somewhat narrower than in specimens of the *intermediate* form, the connecting streak being entirely absent. *Hindwing* unmarked. Underside. *Forewing* with the cell-band and marginal band faintly indicated, the apical area pale yellow tinted. *Hindwing* pale yellow tinted; the discal fascia faintly indicated.

Expanse, ♂ ♀ 2 to  $2\frac{2}{10}$  inches.

LARVA.—Cylindrical, slightly tapering at each end, anal segment slightly bifid; colour, green.

PUPA.—Attached to a leaf. Head with a short frontal snout; a thoracic-dorsal acute prominence, a medial-abdominal lateral angular process on each side (described from Sir W. Elliot's drawing, Madras, 1854).

HABITAT.—North-Western, Central, South-Eastern, and South India; Ceylon.

Note. The Fabrician type specimens, female, of *A. Libythea*, are preserved in the Banksian Collection at the British Museum.

DISTRIBUTION, HABITS, LARVA, ETC.—Mr. L. de Nicéville records "a single female in Col. A. M. Lang's collection, taken at Masuri, W. Himalaya, on June 17th, 1868, at 7,000 feet elevation" (J. Bombay N. H. Soc. 1898, 591). We possess two females labelled "Punjab." A male from Delhi is in the Calcutta Museum. Mr. W. S. Atkinson, in his MS. Notes, writes, "Plains of Bengal; not common." We possess a male from Balasore, Lower Bengal, taken by Mr. Arthur Grote. Mr. W. C. Taylor records it as "common at Khorda in Orissa" (List, p. 15). The late Sir W. Elliot "found the larva in Madras feeding on *Cratæva Roxburghii*, in July, 1854, changing to pupa July 25th, the imago emerging July 29th." Capt. E. Y. Watson found it "not uncommon in Madras, from May to August" (J. Bombay N. H. Soc. 1890, 268). Col. C. Swinhoe obtained "*Libythea* in Bombay, from July to December, in Poona October to April; the form *Ares* in Poona from November to March" (P. Z. S. 1885, 138), also *Libythea* in Mhow, June, and *Ares* also in Mhow, in January" (*id. l.c.* 1886, 431), his types of *retexta* being taken in "Bombay and Poona from July to December" (Ann. N. H. 1890, 360). Messrs. J. Davidson and E. H. Aitken write, "We did not get this butterfly in Kanara, but reared a good many in Bombay during April and May, on *Capparis horrida*. The larva is long, green, somewhat depressed, and has the rough surface and general aspect of a *Terias*, or a *Catopsilia*, but the anal extremity tapers a little and is slightly but



distinctly bifid. The *pupa* is of quite a different type from *Terias* and *Catopsilia*. It is closely attached to a leaf, and the wing-cases do not form a keel, but there is an acute dorsal prominence just behind the head, and a transverse dorsal ridge in the middle connecting two angular lateral processes; the head ends in a short snout; the colour is variable, and probably depends on situation" (J. Bombay N. H. S. 1890, 358). "The butterfly is very common in the forests and on the slope and crest of the Ghâts throughout the dry season. Wherever a patch of moist sand presents itself in the bed of a mountain stream, they form a quivering white cloud, tinged with yellow by specimens of *Appias Hippoides*, and speckled with green by *Papilio Sarpedon*. We have not seen the butterfly much about Karwar, and conclude that it is little on the wing during the rainy season. In the *pupa*, the band is short, so that the vertical side is applied close to the surface to which the pupa is attached, the thorax is stout and not compressed or keeled, segment No. 7 bears on the back a sharp transverse ridge ending in pointed lateral processes. *Capparis horrida* seems to be the favourite food of this species; it is also commonly found on *Cratæva religiosa*. Eggs laid singly" (*id. l.c.* 1896, 573). Mr. G. F. Hampson found it "rare in the Nilgiris, from 1,000 to 3,000 feet elevation" (J. As. Soc. Beng. 1888, 362). In Ceylon Mr. F. M. Mackwood obtained it in the "low country, so far found only in the Kurunegalla country. Capt. Wade took it at Hambantotte in June and July, and Mr. Pole at Puttalam" (Lep. Ceyl. i. 134).

INDO-MALAY SPECIES — *Appias Hippo* (Pap. Hippo, Cramer, Pap. Exot. iii. pl. 195, fig. B. C. ♀ (1782). Herbst, Pap. v. p. 137, pl. 102, fig. 4, 5 ♀ (1792). Pieris Hippo, Godt. Encyc. Méth. p. 143 (1819). Boisd. Spéc. Gén. Lep. i. p. 534, ♀ (1836). *Appias Hippo*, Distant, Rhop. Malay. p. 311, pl. 25, fig. 4, 5, ♂ ♀ (1885). *Catopha* Hippo, de Nicéville, Journ. Asiatic Soc. Bengal, 1895, p. 301. *Tachyris Lyncida Hippo* (pt.), Fruhstorfer, D. Ent. Zeit. 1902, p. 289. *Habitat.* Malacca, Singapore, Sumatra.

*Appias Lyncida* (Pap. Lyncida, Cramer, Pap. Exot. ii. pl. 131, fig. B, ♂ (1779). *Habitat.* Java.

*Appias Enarete* (Pieris Enarete, Boisd. Spéc. Gén. Lep. i. p. 480 (1836). Tach. Lyncida Enaréte, Fruhst. *l.c.* p. 289. *Habitat.* Borneo.

*Appias Formosana* (Pieris Formosana, Wallace, Proc. Zool. Soc. 1866, p. 356. Tachyris Form. Wallace, Trans. Ent. Soc. 1867, p. 366. Fruhst. *l.c.* p. 289. *Habitat.* Formosa.

*Appias inornata*, Moore, Proc. Zool. Soc. 1878, p. 700. Holland, Trans. Amer. Ent. Soc. 1887, p. 121. Tach. Lyncida inornata, Fruhst. *l.c.* p. 289. *Habitat.* Hainan.

*Appias Andrea* (Colias Andrea, Esch. Kotzeb. Reise iii., p. 215, pl. 23, fig. a, b, (1821), ♂. Tachyris Andrea, Wallace, Trans. Ent. Soc. 1867, p. 366, ♀. *Appias Andrea*, Semper, Reise Phil. Lep. p. 242, pl. 39, fig. 6. *Habitat.* Philippines.



## Genus HUPHINA.

*Huphina*, Moore, Lep. of Ceylon, i. p. 136 (1881). Watson, Journ. Bombay, Nat. Hist. Soc. 1894, p. 494.

*Appias* (pt.), Distant, Rhop. Malay. p. 310 (1885).

*Huphina* (pt.), Butler, Ann. Nat. Hist. 1899, p. 201.

IMAGO.—Wings broader and shorter than in typical *Appias*. *Forewing* less triangular, costa much arched from the base, apex almost rounded; costal vein extending to half the margin; upper discocellular veinlet deeply concave, not oblique, lower veinlet less concave; cell shorter. *Hindwing* broader; cell narrower and longer; discocellulars more oblique. Antennal club slender. No tufts to anal valves.

LARVA.—“Cylindrical; anal segment sloped and slightly bifid; segments pubescent, the lateral hairs soft and longest; colour, green” (S. N. Ward, MS. Notes).

PUPA.—Head with a frontal projecting point; thorax laterally and dorsally produced and angled; abdomen laterally ridged, and anteriorly transversely-produced, the posterior segments with slight dorsal points.

TYPE.—*H. Coronis*, Cram.

SEASONAL VARIATION.—“In this genus seasonal variation is shown in the greater prominence of all the dark markings on the upperside and in the much richer coloration of the underside in the *rainy-season* forms, the general tone of the underside of the *dry-season* forms being, in most species, of a much greyer shade; the difference in size is also very marked” (Watson, *l.c.* p. 494).

## HUPHINA CORONIS.

Plate 543.

*Papilio Coronis*, Cramer, *l.c.* i. pl. 44, fig. B, C; ♀ (1776)—*Wet form*. Jones, *Icones, ined.* pl. 9, fig. 2, 2a, ♀.

*Pieris Coronis*, Lang, Ent. Mo. Mag. 1864, p. 102.

*Papilio Phryne*, Fabricius, Syst. Ent. p. 473, ♂ (1775).

*Pieris Phryne*, Butler, Catal. Fabr. Lep. B. M. p. 202 (1869). Elwes, Trans. Ent. Soc. 1888, p. 417.

*Huphina Phryne*, Moore, Lep. of Ceylon, i. p. 136, pl. 53, fig. 1, 1a, b, ♂ ♀, larva (1881). de Nicéville, Journ. As. Soc. Beng. 1885, p. 50, *id. l.c.* 1886, p. 372. *id.* Sikkim Gaz. 1894, p. 168. Swinhoe, Proc. Zool. Soc. 1886, p. 431. *id. l.c.* 1885, 137. *id.* Trans. Ent. Soc. 1893, p. 309. Ferguson, J. Bombay, N. H. Soc. 1891, p. 440. Watson, Journ. Bombay N. H. Soc. 1894, pp. 495, 527, pl. 1, fig. 7 to 12 ♂ ♀. Davidson and Aitken, Journ. Bombay N. H. Soc. 1896, p. 574. Butler, Ann. Nat. Hist. 1899, p. 211.

*Huphina Phryne* (pt.), Adamson, List Burm. Butt. p. 45 (1897).

*Papilio Evagete*, Cramer, Pap. Exot. iii. pl. 221, fig. F. G. ♀ (1782)—*Dry form*.

*Appias Evagete et Zeuxippe*, Rothney, Ent. Mo. Mag. 1882, p. 35.



*Papilio Zeuxippe*, Cramer, *l.c.* iv. pl. 362, fig. E. F. ♀ (1782)—*Intermediate form*.

*Pieris Zeuxippe*, Butler, Catal. Fabr. Lep. B. M. p. 201 (1869).

*Huphina Zeuxippe*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 50. Swinhoe, Proc. Zool. Soc. 1885, p. 137, ♂ ♀ ; *id. l.c.* 1886, p. 431. Moore, Lep. Ceylon iii. p. 522 (1887). Hampson, Journ. As. Soc. Beng. 1888, p. 362.

*Papilio Cassida*, Fabr. Ent. Syst. Suppl. p. 427 (1798).

*Huphina Cassida*, Swinhoe, Proc. Zool. Soc. 1885, p. 137, ♂ ♀ ; *id. l.c.* 1886, p. 431—*Dry form*.

*Pieris Hira*, Moore, Proc. Zool. Soc. 1865, p. 490, pl. 31, fig. 17, ♂—*Extreme dry form*.

*Huphina Hira*, de Nicéville, Journ. As. Soc. Beng. 1885, p. 50.

*Huphina pallida*, Swinhoe, Proc. Zool. Soc. 1885, p. 137, ♂ ♀ —*Extreme dry form*.

*Huphina Nerissa*, de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 590. *id.* Journ. As. Soc. Bengal, 1899, p. 219. Butler, Ann. Nat. Hist. 1899, p. 212. Fruhstorfer, D. Ent. Zeit. 1902, p. 276 ; *id.* Soc. Ent. 1903, p. 25.

*Wet-season Brood* (Plate 543, fig. 1, 1a, ♂, 1b, ♀, 1c, d, ♂, 1e, ♀).

IMAGO.—Male. Upperside greyish-white. *Forewing* with the base of costa irrorated with greyish-black scales ; a black outer marginal band decreasing from beyond one-third from the apex to posterior angle, the black slightly extending inward along the veins for some distance and also more prominently along the subcostal and the two upper medians, enclosing two or three subapical white speckled slender short streaks and a triangular spot between the upper medians ; between the lower median and submedian a slightly-defined lunular cluster of blackish scales is generally present, these scales sometimes extending to the posterior margin. *Hindwing* with a black upper outer marginal macular—or sometimes a continuous dentated band, the lower margin being dark grey scaled and having a submarginal series of similar grey or blackish scaled sagittate confluent marks. Underside. *Forewing* white, the costa and apical interspaces olive-yellow, the veins blackish-bordered, darkest and broadest within the cell, along the subcostal, the median and its two upper branches, including the two lower discal bars. *Hindwing* olive-yellow, with the veins broadly, and the submarginal sagittate confluent-marks, blackish scaled.

Female. Upperside white. *Forewing* with the costa, borders of the cell and the outer veins more or less broadly brownish-black, the medial area of cell, discal streaks, and submarginal spots only being white, the apical spots sometimes being yellow-tinted. *Hindwing* with the costal border, subcostal, median and its upper branch, a discal more or less broad sagittate band and a partly confluent outer-marginal band brownish-black, the medial area of cell, the discal streaks and lower submarginal interspaces only being white or greyish-white, the anal area sometimes being ochreous tinted. Underside similar to the male, except that on the hindwing the medial area of the cell and lower discal streaks are whitish.

Expanse, ♂  $2\frac{1}{4}$  to  $2\frac{3}{4}$ , ♀  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches.



*Intermediate Form* (Plate 543, fig. 1, f, g ♂ ; 1h ♀).

Male. Upperside similar to the *wet-season* form, except that on the *forewing* the black outer band is more marginally restricted, and the lower-discal cluster of speckles generally absent, and the *hindwing* with a marginal upper series of black spots only.

Female. Upperside. *Forewing* with duller black markings, broader white cell area and discal streaks, posterior border and submarginal spots. *Hindwing* with narrower marginal blackish dentate band and lower submarginal sagittate confluent marks. Underside of both sexes similar to *Wet* form, except that the apex of forewing, and the hindwing, is of a paler yellow tint.

Expanse ♂ ♀  $2\frac{1}{4}$  inches.

*Dry-season Brood* (Plate 543, fig. 2, 2a ♂, 2b ♀).

Smaller than the *Intermediate* form (*Zeuwippe*). Male. Upperside. *Forewing* with the black outer band well-defined, the lower-discal speckles absent. *Hindwing* with smaller marginal spots.

Female. Upperside similar to *Intermediate* form, but with all the black markings less prominent. Underside. *Forewing* with fainter blackish cell-borders and discal spots, the costa and apex paler yellow. *Hindwing* uniformly pale yellow, unmarked, or with very faint traces of the ordinary vein markings.

Expanse, ♂ ♀ 2 inches.

*Extreme Dry form* (Plate 543, fig. 2c ♂, 2d ♀).

Smaller than ordinary *Dry-season* form (*Cassida*). Male. Upperside. *Forewing* with the black outer band similar, its enclosed spots small or obsolete. *Hindwing* either immaculate, or with faint traces of a few marginal blackish scales.

Female. Upperside similar to *Dry form* (*Cassida*) except that the *hindwing* is either immaculate, or with faint traces of a few marginal blackish scales. Underside of both sexes similar to *Cassida*, except that the costa and apex of the forewing, and the entire hindwing is of a very pale ochreous-yellow.

Expanse, ♂  $1\frac{4}{10}$  to  $1\frac{8}{10}$ , ♀  $1\frac{5}{10}$  to  $1\frac{8}{10}$  inch.

LARVA.—“Cylindrical; anal segment sloped and slightly bifid; segments pubescent, the lateral hairs soft and longest. Colour, green.” (S. N. Ward, Kanara MS. Notes.) Feeds on Capparis.

PUPA.—Head with a frontal projecting point; thorax laterally and dorsally produced and angled; abdomen laterally ridged and anteriorly transversely produced, the posterior segments with slight dorsal points. Colour, green.

HABITAT.—Lower Ranges of W. and E. Himalayas; Continental India; Ceylon.

DISTRIBUTION AND HABITS.—In the Western Himalaya, as observed by Mr. P. W.



Mackinnon, "it is rare in Masuri; but very common in the Dhoon almost throughout the year, especially the rains brood which flies in August and September" (J. Bombay, N. H. S. 1898, 590). Capt. A. M. Lang found it "abundant in Oudh. I have seen none in the Hills" (Ent. Mo. Mag. 1864, 103). Mr. H. J. Elwes records *Phryne* as being "common in Sikkim, up to 5,000 feet elevation, throughout the season" (Tr. Ent. Soc. 1888, 417). Mr. L. de Nicéville says it is "a common species in the low valleys of Sikkim and up to 5,000 feet. It is subject to very great seasonal variability; the form flying in the spring is small and very pale, that in the rains is very large, dark, and richly coloured" (Sikkim Gaz. 1894, 168). Mr. R. Hunter found the larva and reared the imago of the dry-season form (Hira) at Saugor in March, the larva feeding on the "Koringe" (MS. Note). At Allipore, near Calcutta, Mr. Arthur Grote found and reared the larva. It fed on *Zizyphus scandens* and *Napeia scabra*. Mr. J. Rothney records it as being "common in Barrackpur Park, near Calcutta, in the rainy-season, being fond of flowers, especially of *Duranta Plumieri*" (Ent. Mo. Mag. 1882, 35). Mr. L. de Nicéville also records it as "common in the neighbourhood of Calcutta, the larva feeding on *Capparis horrida*" (J. As. Soc. Beng. 1885, 50). In Orissa, Mr. W. C. Taylor found it "very common at Korda" (List, 1888, p. 15). Col. C. Swinhoe records *Phryne* from the Khasias (Tr. Ent. Soc. 1893, 309). "A single male *Phryne* was taken at Silcuri, Cachar, in July" (J. As. Soc. Beng. 1886, 372). Col. C. Swinhoe records *Pryne* as "common everywhere in Bombay and the Dekkan; *Zeuxippe* at Poona from April to June, and at Belgaum; *Cassida* at Poona from October to April; *pallida* at Poona in January and February, and in Bombay also in February" (P. Z. S. 1885, 137). Col. Swinhoe also obtained "*Phryne* at Mhow from September to November; *Zeuxippe* from April to June, and *Cassida* from November to May" (*l.c.* 1886, 431). Messrs. Davidson and Aitken record the butterfly as "very common in the N. Kanara District, S. India, but much less so in the monsoon than in the dry-season. The larva is green, and the pupa green with brown and white edgings. Feeds on *Capparis*" (J. Bombay N. H. S. 1896, 574). Mr. G. F. Hampson records it from the Nilgiris (J. As. Soc. Beng. 1888, 362). Mr. H. S. Ferguson found it "common in Travancore, both in the low country and Hills" (J. Bomb. N. H. Soc. 1891, 444). In Ceylon, Mr. F. M. Mackwood obtained it "in low country and Hills; chiefly from 2,000 to 4,000 feet elevation, not frequently beyond. Capt. Hutchison took it in Colombo and on the road from Kandy to Trincomalie. Plains, both in cultivated land and forest. Not at all common. Has a slow uncertain flight" (Lep. Ceylon, i. 136). Dr. N. Manders says "*H. Nerissa* is very common in Ceylon, although scarcer in some seasons than in others, and occurs at all elevations. It is highly seasonally dimorphic, and the larva feeds on *Capparis*" (J. As. Soc. Beng. 1899, 220).



Of our illustrations on Plate 543, fig. 1, 1a, b are from a Darjiling *wet-season* male and female, 1c, d, e from a Bombay male and female, 1f a male from Assam, 1g from a Sikkim male, 1h from a Calcutta female; fig. 2 from a *dry-season* male taken in Maumbhoom, Bengal, fig. 2a from a Mhow male, 2b from a N. W. Indian female, 2c, d from a Poona male and female of the *extreme dry form*, taken in December.

## HUPHINA COPIA.

Plate 544, fig. 1, 1a ♂, 1b ♀ (*Wet*), 1c, d ♂, 1e ♀ (*Dry*), 1f, g ♂, 1h ♀ (*Extreme Dry*).

*Pieris Copia*, Wallace, Trans. Ent. Soc. Lond. 1867, p. 340, ♂—*Dry form*.

*Appias Dapha*, Moore, Proc. Zool. Soc. Lond. 1878, p. 838, ♂—*Extreme Dry form*.

*Huphina Dapha*, Watson, Journ. Bombay Nat. Hist. Soc. 1894, pp. 495, 527, pl. 1, fig. 1 to 6, ♂ ♀—*Wet and Dry forms*.

*Pieris Phryne* (pt.), Elwes, Tr. Ent. Soc. 1885, p. 417.

*Huphina Phryne* (pt.), de Nicéville, Sikkim Gaz. 1894, p. 168. Adamson, List. Burm. Butt. p. 45 (1897).

*Wet-season Brood* (Plate 544, fig. 1, 1a ♂, 1b ♀).

IMAGO.—Male. Upperside similar to *wet season* *Coronis*. *Forewing* with comparatively narrower and apically more uniformly or entirely black outer marginal band. *Hindwing* with smaller marginal spots.

Female. Upperside. *Forewing* with the apical area of the marginal band entirely black. Underside. Both sexes with the costa and apex of forewing paler yellow, and on the hindwing the yellow is restricted to the basal area.

Expanse, ♂ 2 to  $2\frac{1}{4}$ , ♀  $2\frac{1}{4}$  inches.

*Dry-season Brood* (Plate 544, fig. 1c, d ♂, 1e ♀)

Male. Upperside similar to *wet form*, except that on the hindwing the marginal spots are less defined and smaller. Female. Upperside with duller black markings than in *wet form*, the apical area of marginal band on forewing entirely black. Underside of both sexes with faintly indicated ordinary dusky borders to the veins, the costa and apex of forewing and the base of hindwing being almost white or tinged with extremely pale yellow.

Expanse, ♂ ♀  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches.

*Extreme Dry Brood* (Plate 544, fig. 1f, g ♂, 1h ♀).

Male. Upperside. *Forewing* with the marginal band narrower than in ordinary *dry form*, the contiguous discal spot in the upper median interspace obsolescent or obsolete. *Hindwing* with the marginal spots very indistinct or obsolete. Female. Upperside white, with less prominent and more restricted markings than in ordinary *dry* or *wet* form, the band on forewing being also, apically, entirely black. Underside



of both sexes white, with very faint ordinary dusky vein borders, the apex of forewing being also slightly dusky-grey.

Expanse, ♂ ♀ 2 to  $2\frac{1}{4}$  inches.

HABITAT.—Sikkim ; Assam ; Burma.

DISTRIBUTION.—We possess the male type specimen described by Mr. Wallace as *P. Copia*, from “Bengal,” and also the male type of *P. Dapha*, from Moulmein ; *wet* and *dry-season* male from Sikkim, taken by Mr. G. C. Dudgeon ; *wet-season* male from Burma, taken by Col. Adamson in September ; *dry-season* males from Moulmein, Pegu, and Ava—taken by Col. Adamson ; Bhamo, November ; taken by Signor L. Fea ; extreme *dry-season* male from Lower Chindwin Hills taken in February by Col. Adamson. Mr. W. Rothschild has a *wet-season* female from Bassein, Burma, and both sexes of the *dry-season* form from Sikkim taken in October and November by Mr. Möller. Col. C. Swinhoe possesses a *wet-season* male from Mandalay, and also *dry-season* male from Cherra Punji and Sikkim. Capt. E. Y. Watson writes, “This form (*Dapha*) is very common throughout Burma, and extends as far as Sikkim, being replaced in the rest of the Indian region by *H. Phryne* (J. Bombay N. H. Soc. 1894, 495). Capt. Watson also figures (*l.c.* plate 1, fig. 1 and 2) a pair of the extreme *wet-season* form, taken in *coitu* at Thayetmyo, Lower Burma, in August ; in fig. 3, 4 a pair, of an *intermediate* seasonal form, taken in *coitu*, at Pokoko, Upper Burma, in October, and in fig. 5, 6 a pair of the extreme *dry-season* form, also taken in *coitu*, at Toungoo, Lower Burma, in January” (*l.c.* p. 496). Col. C. H. E. Adamson writes, “I have taken a large series of *H. Phryne* throughout Burma ; the seasonal forms vary in a similar manner to those of *Zelmira*. It is one of the commonest insects in Central Burma” (List, p. 45). Signor L. Fea obtained it at Bhamo in October. Dr. N. Manders, under *Hira*, says it is “very common in the Shan States and widely distributed” (Tr. Ent. Soc. 1890, 534).

Of our illustrations on Plate 544, fig. 1, 1a are from a male taken by Col. Adamson in September, fig. 1b from a Burma female, in Mr. W. Rothschild’s collection ; fig. 1, c, d, the male type of *Copia* ; fig. 1, e, a female from Sikkim, taken in November by Mr. Möller ; fig. 1f, g, the male type of *Dapha*, from Moulmein, and fig. h, a female Burma, taken by Col. Adamson.

#### HUPHINA LICHENOSA.

Plate 544, fig. 2, 2a ♂, 2b ♀.

*Pieris Lichenosa*, Moore, Proc. Zool. Soc. Lond. 1877, p. 591.

*Huphina Lichenosa*, Watson, Journ. Bombay Nat. Hist. Soc. 1894, p. 495. Butler, Ann. Nat. Hist. 1899, p. 212. Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 277.



IMAGO.—Male. Upperside. Differs from *H. Copia*, on the forewing, in having a more uniformly black and somewhat broader outer marginal band. Underside. *Forewing* with broader blackish bordering to the veins, the costal border and apical veins being of a dusky olivescient-yellow with pale interspaces. *Hindwing* with all the vein-borders, discal, and marginal band uniformly broader, and of a dusky olivescient-yellow, with pale interspaces.

Female. Upperside. *Forewing* with the broad outer band more uniformly black than in the male. *Hindwing* with blackish marginal band similar to the male, but with an inner apical streak. Underside similar to the male, but with less-defined pale interspaces on apex of the forewing and in disc of the hindwing.

Expanse, ♂ ♀  $2\frac{1}{2}$  inches.

HABITAT.—Andaman Islands.

#### HUPHINA LEA.

Plate 545, fig. 1, 1a ♂, 1b ♀.

*Pieris Lea*, Doubleday, Ann. and Mag. Nat. Hist. 1846, p. 23; *id.* Gen. D. Lep. i. p. 45 (1847).

*Huphina Lea*, Moore, Journ. Linn. Soc. Zool. 1886, p. 49. Watson, Journ. Bombay N. H. Soc. 1888, p. 25; *id.* l.c. 1891, p. 53, *id.* 1894, p. 494. Butler, Ann. Nat. Hist. 1899, p. 208. Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 279.

*Appias Lea*, Moore, Proc. Zool. Soc. 1878, p. 838. Adamson, List Burm. Butt. 1897, p. 44.

*Pieris Clemanthe*, Doubleday and Hewitson, Gen. D. Lep. i. p. 45, pl. 6, fig. 3 ♂ (1847).

IMAGO.—Male. Upperside white. *Forewing* with the costa and median vein slightly black scaled; a black outer-marginal narrow band extending decreasingly inward along the borders of the veins from about apical-half of the costa to posterior angle, the portion bordering the upper median generally being the broadest and reaching the lower discocellular veinlet. *Hindwing* with a black narrow outer-marginal band, the black extending inwardly slightly up the veins from the subcostal to middle median, the anal area to near the upper median with a broad deep chrome-yellow patch paling broadly to sulphur-yellow. Underside. *Forewing* white, the costal border, margins of the cell black, the apex and outer-margin dark vinous-brown, enclosing a series of upper-discal and lower submarginal white spots, and three or four small obliquely superposed subapical yellow spots, the base of costa being also tinged with yellow. *Hindwing* bright sulphur-yellow, the anal area and abdominal margin being tinged with deep chrome-yellow; the costal vein, subcostals, median vein, and a broad outer-marginal band varying in width being deep vinous-brown, the latter enclosing a large sulphur-yellow apical spot and sometimes a smaller spot below it, and also, in some specimens, two, or three, lower obscure chrome-yellow scaled narrow lunular spots.



Female. Upperside. *Forewing* white, the base more or less dusky; with broader black costal border, median vein and outer-marginal bordering, the latter enclosing upper-discal small white streaks and lower spots. *Hindwing* white, tinged with pale sulphur-yellow basally; the chrome-yellow anal patch more anally restricted and of a darker or more dusky tint, the outer-marginal band being broader than in the male, and irregularly-sinuuous inwardly. Underside similar to the male, except that, on the hindwing, the markings on the outer-marginal band are complete and more defined.

Expanse, ♂ 2 to  $2\frac{1}{2}$ , ♀  $2\frac{1}{4}$  to  $2\frac{1}{2}$  inches.

HABITAT.—Southern Burma.

DISTRIBUTION.—“Common in the mountains east of Moulmein in January” (W. S. Atkinson, MS. Notes). Col. C. H. E. Adamson writes, “I have caught this butterfly commonly near Rangoon, but it appears to be local, as I have not met with it elsewhere in Burma” (List, p. 44). Capt. E. Y. Watson records it as “a common species in Southern Burma” (J. Bombay N. H. S. 1894, 495). Mr. O. Limborg obtained it in “Moolai, from 3,000 to 6,000 feet elevation” (P. Z. S. 1878, 838). Dr. J. Anderson took it on “Sullivan Island in January, and on Elphinstone Island, Mergui Archipelago, in March” (J. Linn. Soc. Zool. 1886, 49).

#### HUPHINA NADINA.

Plate 545, fig. 2, 2a, b (*Wet*), 2c, d, e (*Dry Brood*).

*Pieris Nadina*, Lucas, Rev. et. Mag. Zool. 1852, p. 333, ♂ *only*. Wallace, Tr. Ent. Soc. 1867, p. 341.

*Huphina Nadina*, de Nicéville, Sikkim Gazetteer, 1894, p. 168. Adamson, List Burm. Butt. p. 44 (1897). Watson, Journ. Bombay N. H. Soc. 1897, p. 670. Butler, Ann. Nat. Hist. 1899, p. 213. Fruhstorfer, D. Ent. Zeit. 1902, p. 277; *id.* Soc. Ent. 1903, p. 26.

*Pieris Nama*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 76, ♂ ♀ (1857); *id.* Proc. Zool. Soc. 1857, p. 102, pl. 44, fig. 1, 2 ♂ ♀ (*Wet form*). Wallace, Tr. Ent. Soc. 1867, p. 340. Elwes, Tr. Ent. Soc. 1888, p. 417.

*Huphina Nama*, de Nicéville, Journ. As. Soc. Beng, 1886, p. 372. Watson, Journ. Bombay, N. H. Soc. 1891, p. 53; *id. l.c.* 1894, pp. 495, 527, pl. 2, fig. 6 ♂ (*Wet*), fig. 7 ♂ (*Dry*). Swinhoe, Tr. Ent. Soc. 1893, p. 309.

*Appias Nama*, Moore, Proc. Zool. Soc. 1878, p. 838.

*Pieris Amba*, Wallace, Tr. Ent. Soc. 1867, p. 340, ♂ (*Dry form*).

*Appias Amba*, Moore, Proc. Zool. Soc. 1878, p. 839.

*Huphina Amba*, Swinhoe, Tr. Ent. Soc. 1893, p. 309.

*Pieris Amboides*, Moore, Journ. As. Soc. Bengal, 1884, p. 46, ♂ (*Dry form*).

*Wet-season Brood* (Plate 545, fig. 2, 2a ♂, 2b ♀).

Male. Upperside white. *Forewing* with the base of costa slightly greyish-black



scaled; a grey-black outer-marginal band curving from middle of costa and decreasing to the posterior angle, its inner edge being crenated, and the apical portion slightly irrorated with white scales between the veins. *Hindwing* with a narrow outer marginal obscurely-defined greyish-black band, the end of the anterior veins being dilatedly-bordered with more distinct black scales forming marginal spots. Underside. *Forewing* with the costal band extending broadly from the base along upper area of the cell, and the continuous but broader outer band dusky olivescient-yellow irrorated with blackish scales, its lower end being blackest, enclosing a submarginal oblique superposed series of small pale olivescient-yellow spots and also a lower whitish spot in the upper median interspace. *Hindwing* dusky olivescient-yellow, with the borders of the costal, subcostals, median vein, and an ill-defined inner-discal and an outer-marginal band, irrorated with blackish scales, leaving the costal and subcostal interspace, and submarginal macular interspaces—and sometimes the abdominal margin—pale olivescient-yellow; a prominent pale olivescient-yellow streak extending along the medial area of the cell, this streak also extending outwardly beyond the cell and sometimes coalesces with the second submarginal spot in the subcostal interspace, the outer portion and also the coalesced spot generally being of a paler tint, or sometimes white.

Female. Upperside blackish-brown; cilia white. *Forewing* with three medial longitudinal white streaks, the upper one broad and extending from a point near base of the cell to the lower discocellular veinlet, from thence decreasing to a point in the discal interspace beyond where it is sometimes joined to a very slender shorter upper streak, followed below by two medial-discal similar white streaks, the upper of which is short, the lower lengthened and outwardly pointed; below the end of the latter is a small white streaky-spot near the posterior angle and then a slender short streak along the posterior margin. *Hindwing* with two medial conjoined longitudinal white streaks, the upper being discally placed beneath the lower subcostal veinlet, the lower extending from near base of the cell to beyond the lower discocellular veinlet. Underside similar to the male, except that, in the *forewing*, there is a lower-discal blackish spot and the posterior margin from the base is broadly blackish, and in the *hindwing*, the medial streaks are white from near base of the cell.

Expanse, ♂ ♀  $2\frac{1}{2}$  to 3 inches.

*Dry-season Brood* (Plate 545, fig. 2c, d ♂, 2e ♀).

Male. Upperside. *Forewing* with similar but somewhat narrower outer black band than in *wet form*. *Hindwing* also with narrower obscure blackish-grey outer margin, the black vein-ends being more distinctly macular. Underside. *Forewing* with the costal border and apical band very pale brownish-ochreous. *Hindwing* also



very pale brownish-ochreous, with faint dusky subcostal and median vein-borders and discal band. In the *extreme dry form* (*Amboides*) the upperside of the forewing has the apical band narrower, and the hindwing is entirely white, without any trace of marginal markings. The *forewing* has the costal border and apical band, and the *hindwing*, pale yellowish-ochreous, the hindwing showing but very faint traces of the subcostal and median dusky borders, the discal band being entirely absent.

Female. Upperside. *Forewing* with the medial white streaks broader than in *wet form*, and confluent, the lower extending to beneath the lower median veinlet, below which is a slight streak along posterior margin. *Hindwing* with the medial white streaks broader than in the *wet form*, the lower basal and discal area being also greyish white. Underside similar to the *wet form* except that the costal and apical border of the forewing, and the hindwing is of a pale ochreous-brown.

Expanse, ♂ 2 to  $2\frac{1}{2}$ , ♀  $2\frac{1}{2}$  inches.

HABITAT.—N.E. India; Burma; Tenasserim.

DISTRIBUTION.—We possess specimens of the *wet-season* form from Sikkim, Silhet, Khasias, Manipur, Burma, and the Shan States, and of the *dry-season* form, the male types of *Amba* and *Amboides*. Capt. E. Y. Watson writes, "This species (*Nama*) with its dry-season form (*Amba*) occurs fairly common throughout N.E. India, and Burma" (J. Bombay N. H. S. 1894, 496). Mr. H. J. Elwes records it as being "common in Sikkim up to 3,000 or 4,000 feet elevation, nearly all the year round. The specimens found in the cold weather from December till March have the underside of a pale greyish-brown with hardly any green tint, and the markings almost obsolete" (Tr. Ent. Soc. 1888, 417). Mr. L. de Niceville writes, "It is common in Sikkim at low elevations from March to December. The spring or dry-season form, named *Amba*, is much smaller and paler than the rains form, having the underside pale greyish-brown instead of rich green" (Sikk. Gaz. 1894, 168). Col. C. Swinhoe records it from the Khasias (Tr. E. Soc. 1893, 309). Col. C. H. E. Adamson obtained it in "Bhamo and Upper Tenasserim. It varies much in size and in the tone of the colouring of the underside" (List, 1897, 44). Mr. O. Limborg took it in "Houngduran; Tao at 3,000 to 5,000 feet, in March; Moolai and Moolat, 3,000 to 6,000 feet" (P. Z. S. 1878, 838). Capt. Watson (*l.c.* pl. 2, fig. 6) figures the male of rainy-season form, taken in the N. Chin Hills, Upper Burma, in April, and (fig. 7) from the Yaw District, taken in December" (J. Bombay N. H. S. 1894, 496).

Of our illustrations on Plate 545, fig. 2, 2a are from a male and 2b a female of the wet-season form from E. Bengal; fig. 2c, d from the male type of the *dry-season* form *Amba*, and 2e from a Sikkim female.





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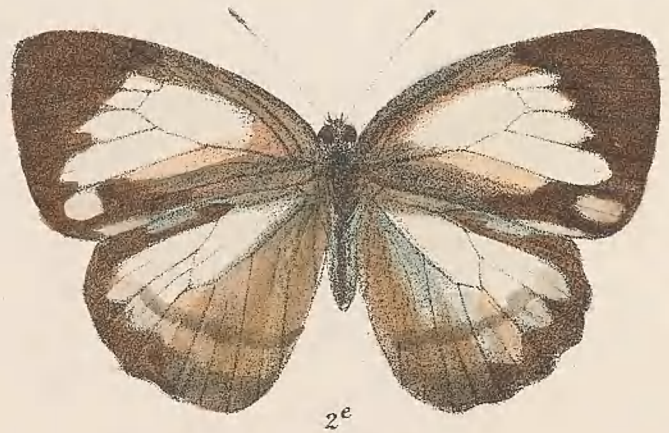
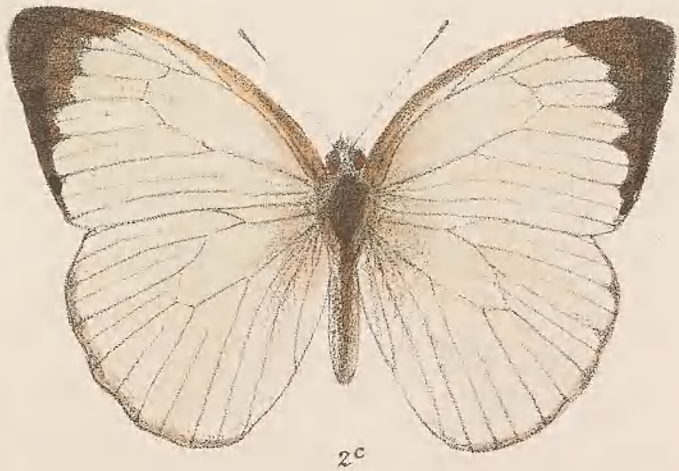
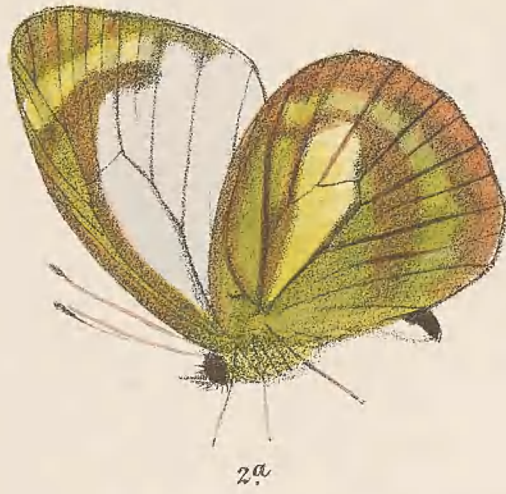
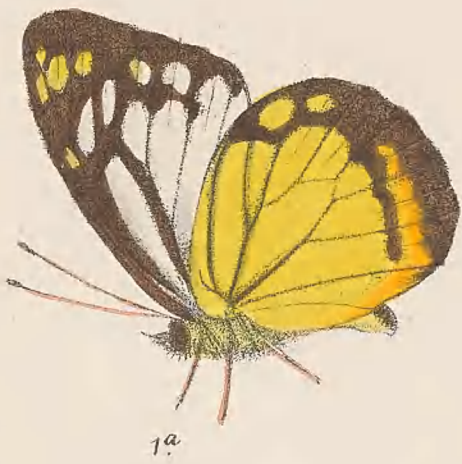
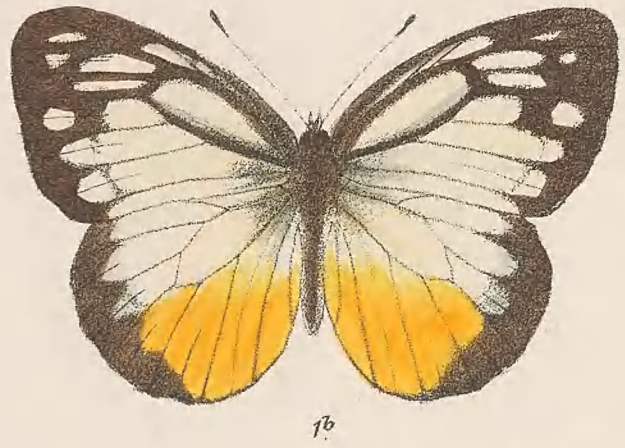
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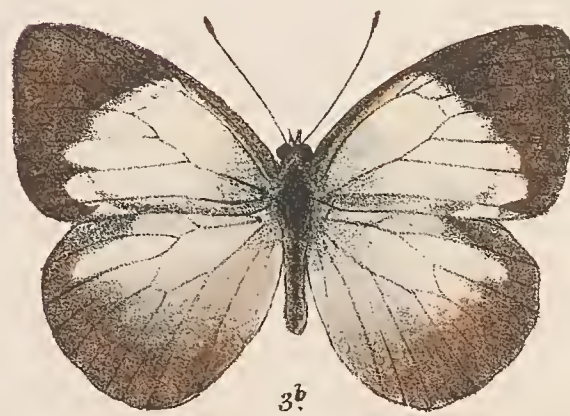
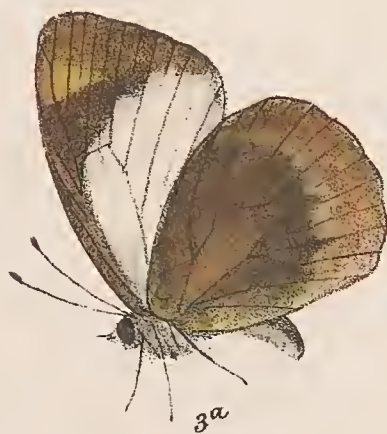
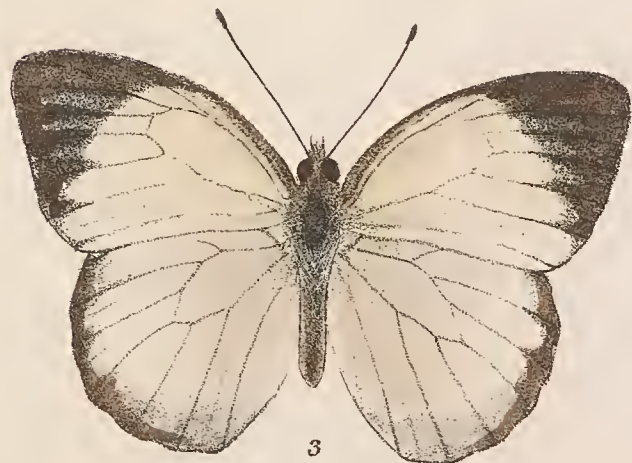
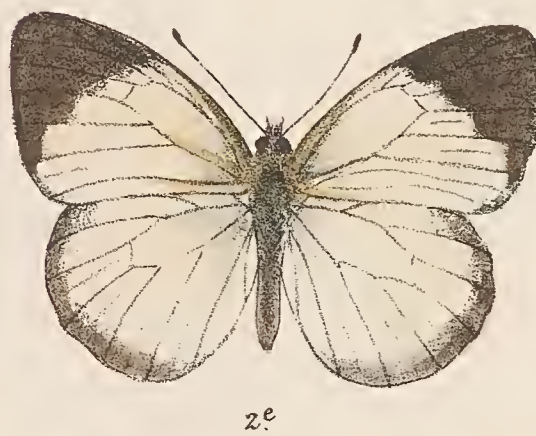
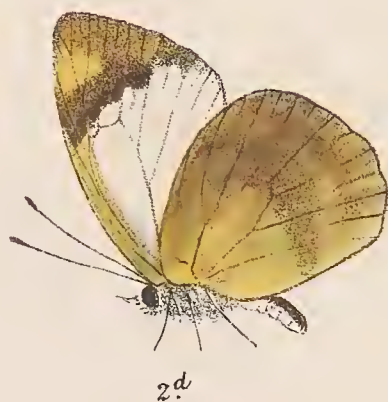
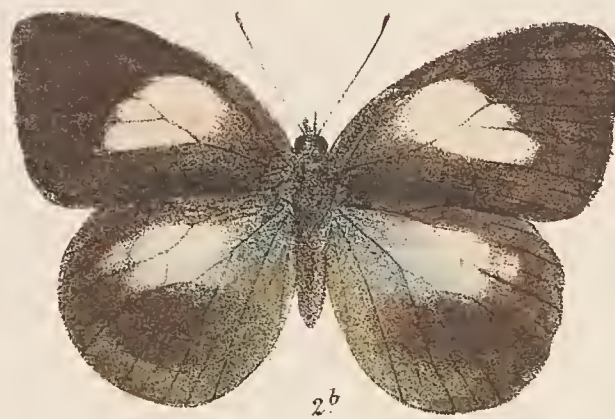
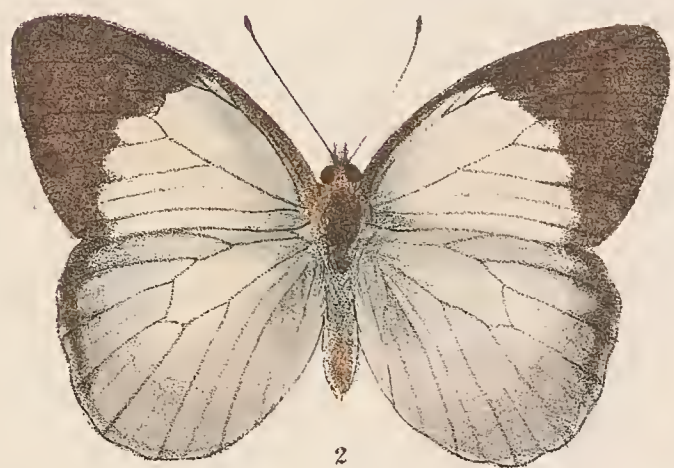
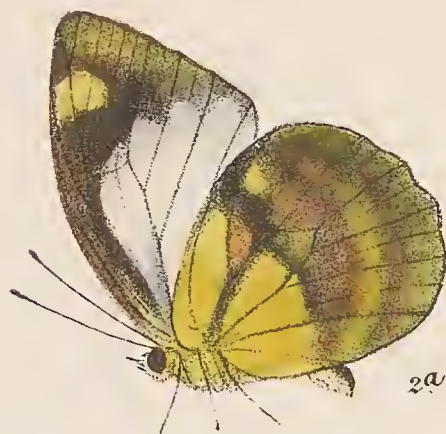
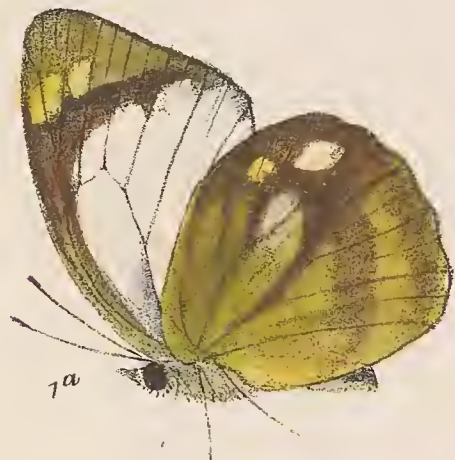
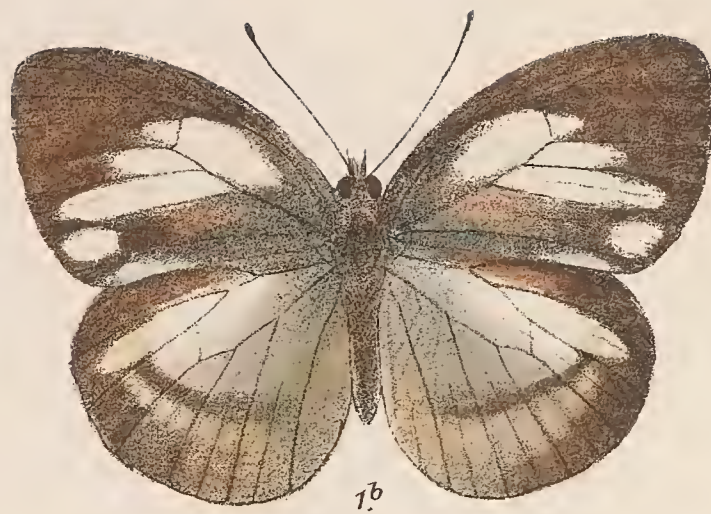
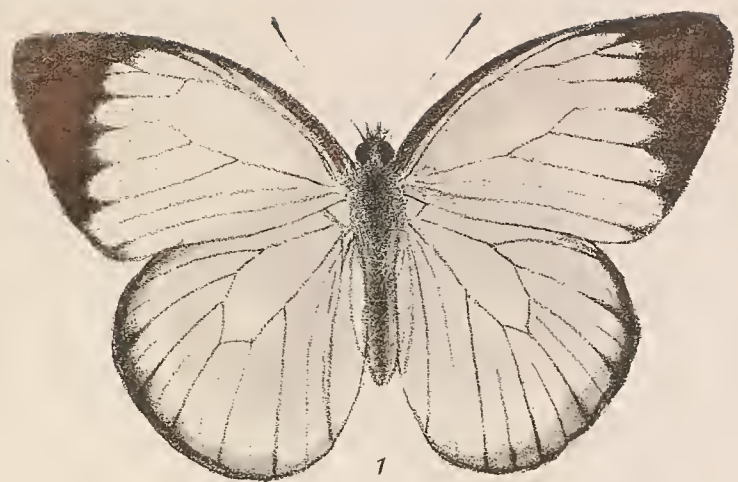
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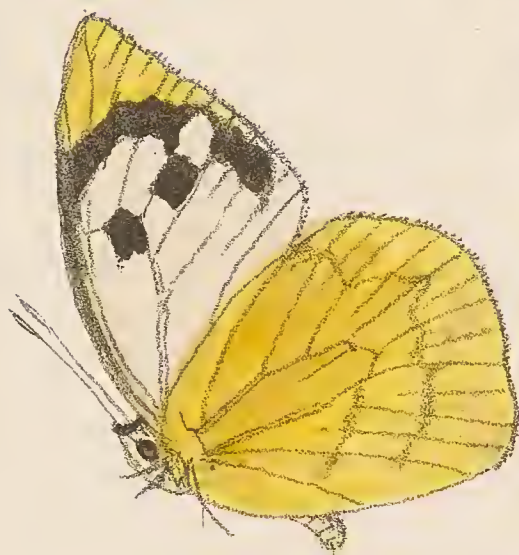
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1b



1c



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1d



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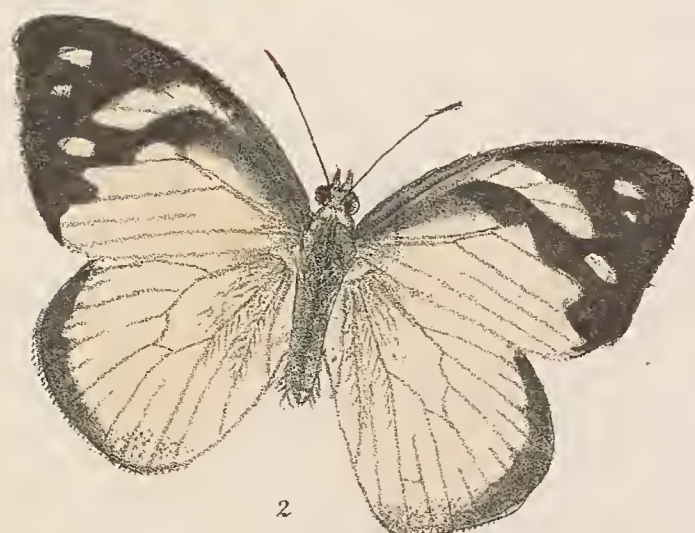
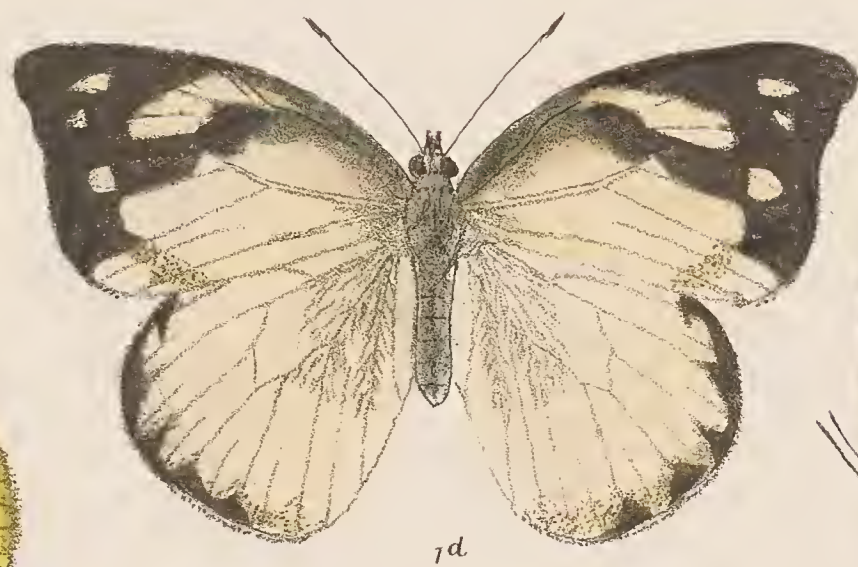
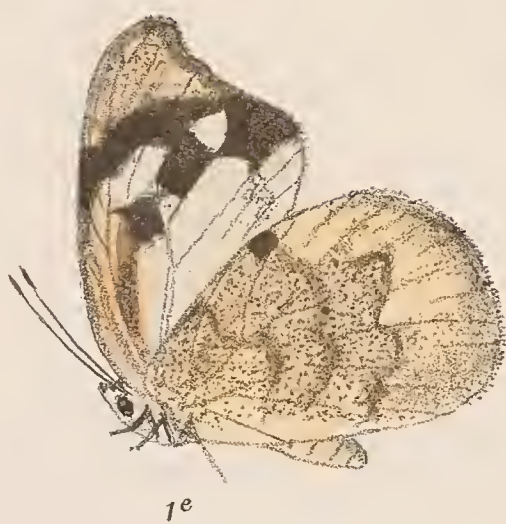


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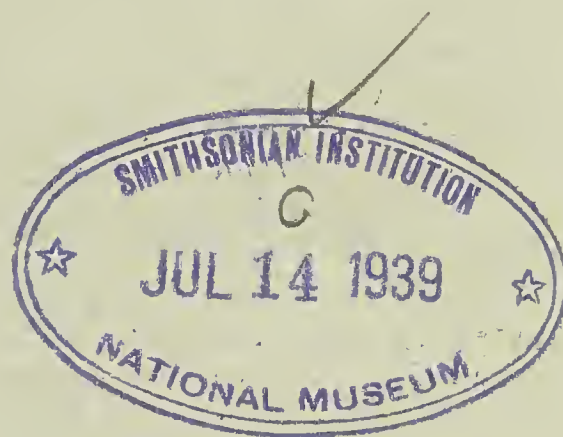
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HUPHINA ANDAMANA.

Plate 546, fig. 1, 1a ♂, 1b ♀.

*Huphina Nama*, var. *Andamana*, Swinhoe, Proc. Zool. Soc. Lond. 1889, p. 398. Butler, Ann. Nat. Hist. 1899, p. 213.

*Pieris Nama*, Moore, P. Z. S. 1877, p. 591.

IMAGO.—Male. Upperside similar to *wet form* of *Nadina*. Underside. *Forewing* also similar to *Nadina*, except that the cell streak is restricted to the apex across the lower discocellular, and, with its contiguous portion at base of upper discocellular interspace, is very short, both portions being white or pale yellow tinted; the inner area of the cell being filled up with dusky olivescient green.

Female. Upperside. *Forewing* with the three medial white streaks broader than in female *Nadina*, the cell portion shorter, the spot at posterior angle is larger, and the streak below it broader; the lower medial streak sometimes extending beneath the lower median and is partly coalescent with the posterior spot. *Hindwing* with the basal area of the cell, and lower area beneath it from the base to the disc, is grey, and merging into the white streak from the apex of cell, and its outer portions; the lower outer-margin is numerously grey or olive-grey scaled, leaving an obscure indication of a submarginal lunular band. Underside. *Forewing* similar to *Nadina*. *Hindwing* similar to the male.

Expanse ♂  $2\frac{1}{2}$  to  $2\frac{3}{4}$ , ♀ 2 to  $2\frac{3}{4}$  inches.

HABITAT.—Andaman Islands.

HUPHINA REMBA.

Plate 546, fig. 2, 2a, b ♂ ♀ (*Wet*), 2c, d, e ♂ ♀ (*Dry form*).

*Pieris Remba*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 75 ♂ (1857), *wet form*. Wallace, Trans. Ent. Soc. 1867, p. 340 ♀.

*Huphina Remba*, Hampson, Journ. As. Soc. Bengal, 1888, p. 363. Ferguson, J. Bombay N. H. S. 1891, p. 444. Watson, Journ. Bombay Nat. Hist. Soc. 1894, pp. 496, 523. Davidson and Aitken, *id. l.c.* 1896, p. 575. Butler, Ann. Nat. Hist. 1899, p. 214. de Nicéville, Journ. As. Soc. Beng. 1900, p. 256.

*Huphina liquida*, Swinhoe, Ann. Nat. Hist. 1890, p. 361, ♂ ♀ — *Dry form*.

*Pieris Nama*, var. Hewitson, Exot. Butt. ii. P. pl. 6, fig. 37 ♂.

*Wet-Season Brood* (Plate 546, fig. 2, 2a ♂, 2b ♀).

IMAGO.—Male. Upperside greyish-white; base of wings greyish. *Forewing* with the costal border to or close to the subcostal vein black, the black continuing outward and forming a broad exterior marginal band decreasing hindward from the discocellulars to the posterior margin, the inner edge of the band being sinuous; the band in some specimens is very sparsely sprinkled with minute grey scales between



the anterior veins, when the traversing veins are more prominently black-lined. *Hindwing* with a black-scaled exterior marginal sinuated posteriorly-decreasing band, the posterior portion being broadly grey-scaled. Underside. *Forewing* with the blackish costal band broader and extending from within the base and along upper half of the cell area, the connected outer band being apically speckled with greenish-yellow scales and with a subapical greenish-yellow streak crossed by subcostal veinlets; base of costal border also slightly sulphur-yellow scaled. *Hindwing* with the basal half greenish-yellow, crossed by the blackish-scaled veins, the subcostal being also broadly bordered by similar scales; the outer half of the wing blackish, traversed by an obscurely-defined curved discal and an outer marginal series of greenish-yellow spots, of which series the upper discal spot is most distinct. *Body* above dark grey; front of head, palpi, and thorax beneath greenish-yellow, palpi above blackish; abdomen beneath white; femora yellow; tibiae and tarsi black, tibiae whitish speckled above; antennae black, annulated with white.

Female. Upperside brownish-black. *Forewing* with the basal ground-colour paler than the outer and somewhat grey-scaled; a greyish-white medial oblique irregular-shaped patch extending across anterior half of the cell to lower median, its outer edge being sinuous; in some specimens the basal area is greyer, the white medial area broader and extending brokenly hindward to the posterior margin. *Hindwing* with the basal and outer posterior submarginal area dark grey scaled; a greyish-white medial patch occupying the outer half of the cell and basal interspaces from the lower subcostal and the upper median; in some specimens this patch is larger and its edges less defined, the outer posterior submarginal grey scales more thickly clustered. Underside similar to the male, except that, on the forewing, there is a short blackish-scaled oblique streak on middle of the posterior margin.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{5}{10}$ , ♀  $2\frac{2}{10}$  to  $2\frac{4}{10}$  inches.

*Dry-season Brood* (Plate 546, fig. 2c, d ♂, 2e ♀).

Smaller than *Wet form*. Upperside similar. *Forewing* with the outer band somewhat narrower and more attenuated posteriorly. *Hindwing* with the outer band much narrower. Underside with similar markings to the *wet form*, but generally paler and duller coloured.

Female. Upperside greyish-white; somewhat like the male. *Forewing* with black outer-marginal band similar to that of the male, but more attenuated below the middle median. *Hindwing* with an almost similar outer-marginal band, the anterior portion being somewhat broader. Underside similar to the male, with the markings on both wings paler and the coloration duller.

Expanse, ♂ ♀ 2 to  $2\frac{2}{10}$  inches.

HABITAT.—South India.



DISTRIBUTION.—“This is a forest butterfly, and is found in the N. Kanara District, wherever there is heavy forest, at all seasons. In its rainy-season dress it is a very richly-coloured butterfly, the female being more black than white on the upperside, and on the underside rich greenish-yellow mingled with smoky-brown. The larva and pupa are scarcely distinguishable from those of *H. Phryne*, and feed on the same plants” (Davidson and Aitken, J. Bombay N. H. Soc. 1896, 575). In the Nilgiris it is “common on the western slopes, but a rare straggler throughout the rest of the district” (Hampson, J. As. Soc. Bengal, 1888, 363).

#### HUPHINA CINGALA.

Plate 546, fig. 3, 3a ♂, 3b ♀.

*Huphina Remba*, Moore, Lep. of Ceylon, i. p. 137, pl. 53, fig. 2, 2a ♂ (1881). de Nicéville, Jour. As. Soc. Beng. 1899, p. 220.

IMAGO.—Male. Upperside similar to Remba. *Forewing* with the costal black-scaled edge extremely slender, the outer marginal black band narrower than in *Remba*, its inner anterior edge being at some distance from the discocellulars and the posterior end much attenuated. *Hindwing* with the marginal black band very narrow, in some being almost macular in its course; the grey posterior edging being also much narrower and less apparent. Underside similar to Remba. *Forewing* with the costal border and outer band narrower, as on the upperside. *Hindwing* with the markings more obscurely defined and the coloration much duller.

Female. Upperside similar to palest examples of Remba. *Forewing* with the outer band narrower and not extending to the discocellulars. *Hindwing* with the grey basal area extending to the costa, its outer edge prolonged between the lower subcostal and radial, the outer marginal area not speckled with submarginal clusters of grey scales. Underside similar to the male.

Expanse, ♂  $2\frac{2}{10}$  to  $2\frac{5}{10}$ , ♀ 2 inches.

HABITAT.—Ceylon.

DISTRIBUTION.—Mr. F. M. Mackwood records it as “rare in the Hills, from 2,000 to 4,000 feet elevation” (Lep. Ceylon, i. p. 137). “An uncommon insect in Ceylon, and of speedy flight, consequently difficult to catch. It is found in the hill country between 2,000 and 4,000 feet, and is common at Pundaloya” (de Nicéville, J. As. Soc. Bengal, 1899, p. 220).

INDO CHINA AND MALAYAN SPECIES.—*Huphina Nerissa* (Pap. Nerissa Fabricius, Syst. Ent. p. 471, ♂ (1775). *Pieris Nerissa*, Butler, Catal. Fabr. Lep. Brit. Mus. p. 202 (1869). *Syn. Pap. Amasene*, Cramer, Pap. Exot. i. pl. 44, fig. A, ♂ (1776). *Habitat.* South China; Hainan.

*Huphina Andersoni*. (Appias Andersoni, Distant, Ann. Nat. Hist. 1885, p. 146 ;



*id.* Rhop. Malay. p. 315, pl. 33, fig. 2, ♂ (1885). Butler, Ann. N. H. 1899, p. 213. *Habitat.* Malay Peninsula.

*Huphina Sumatrana* (Hagen, 1896). Butler, Ann. N. H. 1899, p. 212. Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 277. H. Nerissa, de Nicéville, J. As. Soc. Beng. 1895, p. 506. *Habitat.* Sumatra.

*Huphina Corva* (Pieris Corva, Wallace, Trans. Ent. Soc. 1867, p. 339). Butler, *l.c.* p. 212. Fruhstorfer, *l.c.* p. 277. Pontia Coronis, Horsfield, Catal. Lep. Mus. E. I. Company, p. 144, pl. 4, fig. 9, 9a, larva and pupa (1829). P. Coronis (part), Moore, Cat. Lep. E. I. C. i. p. 76, pl. 1, fig. 12, 12a, larva and pupa (1857). *Habitat.* Java.

*Huphina Fawcetti*, Butler, Ann. Nat. Hist. 1899, p. 213, ♂. *Habitat.* Sumatra.

*Huphina Olga* (Pieris Olga, Eschscholtz, Kotzeb. Reise, iii. p. 214, pl. 9, fig. 21a, b (1821). Semper, Reise Phil. Lep. 238, pl. 37, fig. 1 to 11, ♂ ♀ (1890). Butler, *l.c.* p. 210. Fruhst. *l.c.* 1902, p. 278. *Habitat.* Philippines.

*Huphina Olgina* (Pieris Aspasia var. Olgina, Staudinger, Deuts. Ent. Zeit. Lep. 1889, p. 19. Butler, *l.c.* p. 210. Fruhst. *l.c.* 1902, p. 282. *Habitat.* Palawan.

*Huphina Judith* (Papilio Judith, Fabricius, Mant. Ins. ii. p. 22 (1787). Donovan, Ins. India, pl. 27, fig. 2 (1800). Pieris Judith, Butler, Cat. Fabr. Lep. B. M. p. 203 (1869), *id.* Ann. N. H. 1899, p. 209. de Nicéville, J. As. Soc. Beng. 1895, p. 507, Fruhst. *l.c.* 1902, p. 281. *Habitat.* Java.

*Huphina Selma* (Pieris Selma, Weymer, Stett. Ent. Zeit. 1885, p. 269, pl. 2, fig. 5). Butler, *l.c.* 1899, p. 209. Fruhst. *l.c.* 1902, p. 281. *Habitat.* Nias Island.

*Huphina Ethel*, Doherty, Journ. As. Soc. Bengal, 1891, p. 29. Butler, *l.c.* 1899, p. 209. Fruhst. *l.c.* 1902, p. 281, *id.* Berl. E. Z. 1904, p. 200, pl. 2, fig. 3a, b ♀. *Habitat.* Engano Island.

*Huphina Hespera*, Butler, Ann. Nat. Hist. 1899, p. 208. Fruhst. *l.c.* 1902, p. 279. *Habitat.* Sarawak; Labuan.

*Huphina Montana*, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 279. *Habitat.* N. Borneo.

*Huphina Meridionalis*, Fruhstorfer, *l.c.* 1902, p. 279. *Habitat.* S. Borneo.

*Huphina Amalia* (Pieris Amalia, Vollenhoven, Mon. Pier. p. 23, pl. 3, fig. 6 ♂ (1865). Wallace, Tr. Ent. Soc. 1867, p. 336. Distant, Rhop. Malay. p. 314, pl. 33, fig. 1 ♂ (1885). *Huphina Lea* (pt.), de Nicéville, J. As. Soc. Beng. 1895, p. 506. Fruhst. *l.c.* 1902, p. 279. *Habitat.* Malay Peninsula; Singapore; Sumatra.

*Huphina Siamensis*, Butler, Ann. Nat. Hist. 1899, p. 208, ♂ ♀. Fruhst. *l.c.* 1902, p. 279. *Habitat.* Siam.

*Huphina Pactolica* (Pieris Pactolica, Butler, Proc. Zool. Soc. 1865, p. 455, pl. 26, fig. 1 ♂); *id.* Ann. N. H. 1899, p. 207. *Habitat.* Borneo.



*Huphina Malaya* (H. Lea var. *Malaya*, Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 279. *Habitat.* Singapore.

*Huphina Boisduvaliana* (Pieris Boisd. Felder, Wien. Ent. Monats. 1862, p. 287; *id.* Reise Nov. Lep. ii. p. 168, pl. 24, fig. 8, 1865. Semper, Reise Phil. Lep. p. 237, pl. 37, fig. 12). Butler, *l.c.* 1899, p. 205. Fruhst. Berl. Ent. Zeit. 1903, p. 106. *Syn.* P. *Semperi et Balbagona*, Semper, *l.c.* p. 238, pl. 37, fig. 13-15; pl. 38, fig. 2, 3 (1890). *Habitat.* Philippines.

*Huphina Rachel* (Pieris Rachel, Boisduval, Spéc. Gén. Lép. i. p. 469 (1836). Butler, *l.c.* 1899, p. 203. Fruhst. Berl. Ent. Zeit. 1903, p. 104. *Habitat.* Java.

*Huphina Cardena* (Pieris Cardena, Hewitson, Exot. Butt. ii. P. pl. 3, fig. 17, 18 (1861). Vollenhoven, Monog. p. 25. *Tachyris Cardena*, Wallace, Tr. Ent. Soc. 1867, p. 363. Appias Cardena, Distant, Rhop. Malay. p. 316, pl. 33, fig. 3, ♂ (1885). *Hyposcritia Cardena*, de Nicéville, J. As. Soc. Beng. 1895, p. 504. *Syn.* Pieris Hagar, Vollen. Monog. Pier. p. 38, pl. 4, fig. 6 (1865). *Habitat.* Borneo (type); Sumatra; Malay Peninsula.

*Huphina Eunama*, Fruhstorfer, Berl. Ent. Zeit. 1903, p. 110. *Habitat.* S. Formosa.

Genus UDAIANA, Distant, Rhop. Malayana, pp. 286, 300 (1885). *Udaiana Cynis* (Pieris Cynis, Hewitson, Exot. Butt. iii. P. pl. 8, fig. 54, ♂ (1866). Wallace, Tr. Ent. Soc. 1867, p. 341. Distant, *l.c.* p. 301, pl. 26, fig. 5 ♂, 6 ♀ (1885). de Nicéville, Journ. As. Soc. Bengal, 1895, p. 494, ♂ ♀. Butler, Ann. Nat. Hist. 1899, p. 214. *Syn.* U. *Pryeri*, Distant, *l.c.* p. 301, ♂. U. *Androides*, Hagen, Iris, 1894, p. 32. *Habitat.* Malay Peninsula; Sumatra; Borneo.

#### Genus HYPOSCRITIA.

*Hyposcritia*, Geyer, in Hübner's Zuträge Exot. Schmett. iv. p. 16 (1832). Moore, Lep. of Ceylon, i. p. 133 (1881).

*Tachyris* (sect. D.), Wallace, Trans. Ent. Soc. 1867, pp. 363, 381.

*Hyposcritia*, Butler, Ann. and Mag. Nat. Hist. 1898, p. 392.

IMAGO.—Male. *Forewing* less triangular than in *Catophaga*; costa more arched, exterior margin slightly crenulated anteriorly. *Hindwing* with the costa straighter and oblique, the exterior margin obliquely-convex; costal vein much arched at the base. Antennal club lengthened. Anal tufts prominent; intromittent organ generally exserted. Males somewhat similar in pattern of markings to the females of the species of *Catophaga*.

TYPE.—H. Pandione.



## HYPOSCRITIA LALAGE.

Plates 547 and 548.

*Pieris Lalage*, Doubleday, Gray's Zool. Misc. p. 76, ♀ (1842), *id.* Gen. D. Lep. i. pl. 6, fig. 5, ♀ (1847). Moore, Proc. Zool. Soc. 1865, p. 759.—*Wet form.*

*Tachyris Lalage*, Wallace, Trans. Ent. Soc. 1867, p. 382. Elwes, *ib. l.c.* 1888, p. 419. de Nicéville, Sikkim Gazetteer, 1894, p. 169.

*Hiposcritia Lalage*, Butler, Ann. and Mag. Nat. Hist. 1885, p. 340, ♂. Adamson, List Burm. Butt. 1897, p. 44.

*Hyposcritia Lalage*, Butler, *ib. l.c.* 1898, p. 394.

*Appias Lalage*, Mackinnon and de Nicéville, Journ. Bombay Nat. Hist. Soc. 1898, p. 591.

*Pieris Durvasa*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 73 (1857); *id.* Proc. Zool. Soc. 1857, p. 103, pl. 44, fig. 6, ♂.

*Hiposcritia Durvasa*, Butler, Ann. Nat. Hist. 1885, p. 340, ♂.

*Wet-season Brood* (Plate 547, fig. 1, 1a, c, d ♂, 1e, f ♀).

IMAGO.—Male. Upperside greyish-white; basal area of forewing glossy. *Forewing* with the base of costal border thickly irrorated with grey-black scales, these scales are also more or less scattered along upper area of the cell to the discocellular black spot, the black then extending costally into a broad outer marginal decreasing band, which latter ends abruptly at the lower median, and in some specimens black scales are more or less scattered obliquely-inward to the posterior margin, thus enclosing a white spot at the angle, similar to that in the female, the anterior inner-edge of the band curves sinuously outward from the costal border above end of the cell to upper median, below which it extends quadrately-inward and then outward to the lower median, the band enclosing two small white subapical obliquely-disposed spots, sometimes also an obscure upper spot, and a large angular spot between the upper and middle median; a more or less large black spot is also present on the lower discocellular veinlet, this spot being generally slenderly or broadly joined to the outer band along the upper median veinlet. *Hindwing* with a black outer-marginal narrow band, which is almost macular, and, generally, with a connecting submarginal zigzag series of blackish scales, extending inward from the lower subcostal to the upper median, and in some these scales from thence are obscurely and broadly scattered posteriorly. Underside. *Forewing* greyish-white, the black discocellular spot and outer marginal band as on upperside, the band being narrowed anteriorly, the apical area being ochreous-yellow; from the lower end of the band some distinctly-apparent blackish scales generally extend inward towards the posterior margin. *Hindwing* uniformly ochreous-yellow, with slightly apparent blackish scaled submarginal zigzag slender fascia and a similar but less apparent medial fascia; a distinct black dot on the discocellular veinlet.

Female. Upperside greyish-white. *Forewing* with the base of costa and basal two-thirds of the cell dark grey-black scaled, the black outer border broader than in



male, extending hindward to the posterior angle and from thence decreasingly inward along the margin to base of the wing, its projecting portion between the upper and middle median extending broadly obliquely-inward, encompassing the discocellular spot across anterior half of the cell, thus only leaving a white narrow outwardly-oblique recurved upper band, and a broad lower white band, the basal portion of which is sometimes glossy; the extreme edge of posterior margin of the wing and its cilia being also white; subcostal spots and a medial white spot, as on upperside, the latter being smaller, and there is also a white spot at posterior angle. *Hindwing* greyish-white, the basal area sometimes very faintly flushed with pale yellow; a prominently black outer-marginal band and connected submarginal zigzag fascia, the latter becoming broadly continuous and more or less confluent posteriorly. Underside. *Forewing* with duller black markings similar to upperside, except that the apex is broadly pale greyish ochreous-yellow or glossy grey, with the subapical spots slightly indicated; the base of cell and costa being pale yellow. *Hindwing* paler yellow than in male, or greyish-white and slightly glossy, the yellow being more clearly defined along the vein borders and extreme outer margin, with slightly apparent dusky-scaled submarginal and medial zigzag fascia, and discocellular black dot, as in the male, the outer marginal interspaces being whitish and somewhat glossy. *Body* greyish-white; front and abdomen above dark grey; antennæ black above, white beneath in the male; anal tufts blackish; intromittent organ sometimes exerted.

Expanse, ♂ ♀ 3 inches.

*Intermediate form* (Plate 547, fig. 1b ♂).

Male. Upperside. *Forewing* with the black outer band somewhat narrower, the projecting discal portion and the discocellular spot generally smaller, the latter being usually isolated; three subapical white spots are sometimes present; the median interspaced white spot is larger. *Hindwing* with narrower black outer-marginal macular band, or its spots are slenderly defined only at end of the veins. Underside. *Forewing* similar to the upperside, the apex paler yellow than in *wet* form. *Hindwing* similar to *wet* form, but generally of a paler yellow.

Female. Upperside. *Forewing* similar to the *wet* form, except that the black outer band is less intensely black from the lower median and extends obsolescently inward to about half the posterior margin. *Hindwing* with the black outer-marginal band less intense than in the *wet* form, more macular, its connected submarginal zigzag fascia less defined and becomes obsolescent posteriorly from the upper median. Underside similar to *wet* form. *Forewing* with the outer band less defined posteriorly from the lower median. *Hindwing* pale yellow; marginal interspaces whitish, but not glossy.

Expanse, ♂  $2\frac{1}{2}$  to  $2\frac{3}{4}$ , ♀  $2\frac{3}{4}$  inches.



*Dry-season Brood* (Plate 548, fig. 1, 1a ♂, 1b, c, d, e ♀).

*Catopha Pseudolalage*, Moore, Proc. Zool. Soc. 1879, p. 142, ♂ ♀.

*Hiposcritia Pseudolalage*, Butler, Ann. Nat. Hist. 1885, p. 340.

*Hiposcritia Argyridina*, Butler, Ann. Nat. Hist. 1885, p. 340, ♂.

Male. Smaller than *wet* form. Upperside. *Forewing* with the base glossy, the black outer band somewhat narrower, and its discal portion more or less disconnected, its posterior end always terminating at the lower median; the discocellular spot smaller and always isolated. *Hindwing* either with a slight black linear tip to the upper veins, or entirely white. Underside. *Forewing* with the black outer band less prominent than in *wet* form, also narrower and its course broken, the apical area being pale greyish-ochreous and slightly irrorated with brown scales, the discocellular spot isolated. *Hindwing* pale brownish-ochreous, more or less slightly irrorated with brown scales, the submarginal and discal zigzag brownish-scaled fascia slightly defined, the discocellular black dot distinct.

Female. Smaller than *wet* form. Upperside. *Forewing* with the base glossy; the black outer band similar, its lower end terminating either at the lower median or with some scattered scales inwardly-disposed before the posterior angle; the discocellular spot either slightly extending along upper median, or broadly joined to the discal portion of the outer band, and inwardly along upper area of the cell. *Hindwing* with the black outer marginal band macular and decreasing obsolescently hindward, or the band is more continuous and with a more or less slightly apparent blackish-scaled submarginal zigzag fascia. Underside. *Forewing* with similar black markings as on upperside, the apical area being greyish-ochreous and brown-scaled, the base of the cell flushed with greyish-ochreous. *Hindwing* pale greyish-ochreous and numerously irrorated with brown scales except in the outer-marginal interspaces where these scales are less apparent, the discal and submarginal darker-scaled zigzag fascia and black discocellular dot distinct.

Expanse, ♂ 2 to  $2\frac{1}{2}$ , ♀  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches.

HABITAT.—Western and Eastern Himalayas; Assam; Naga Hills; Manipur; Burma, Shan States; Tenasserim.

DISTRIBUTION.—The late Mr. L. de Nicéville, in his MS. Notes on Pierinæ, writes, “*Lalage* has a wide range, extending from the Western Himalayas eastward through Kumaon, Nepal, Sikkim, Bhotan, Assam, to Indo-China, and southwards through Manipur and Upper Burma to Tenasserim, where it meets *Lagela*. It is, as far as is known, found only in the mountains, where it is usually not uncommon, and has been found at an elevation of over 10,000 feet. In the Khasia Hills it occurs on the highest peak on the Shillong plateau, 6,400 feet.” Mr. P. W. Mackinnon found it “very common in Masuri, Western Himalayas, and on the adjoining Hills, in April



and May. The sexes here differ but slightly, the dry-season form of the female being alone found. The butterflies seem always to be flying from east to west, this observation having been made at two places more than twenty miles apart" (J. Bombay N. H. S. 1898, 591). Mr. H. J. Elwes records it as "common in Sikkim at low elevations from April to October. The females, which are rarer than the males in their proper habitat, have the habit of flying up to great heights on the mountains. I took females on Tonglo at 8,500 feet, on the Rishila in Bhotan at 10,400 feet, and in the Khasia Hills at the highest peak on the Shillong plateau, 6,400 feet; but saw no males in any of these places" (Tr. Ent. Soc. 1888, 419). Mr. L. de Nicéville says it "occurs in Sikkim from the level of the Terai to over 10,000 feet elevation, and flies from April to October" (Sikk. Gaz. 1894, 169). Col. C. Swinhoe records it as "common in the Khasia Hills, also Shillong and Cherra Punji" (Tr. Ent. Soc. 1893, 310). Dr. G. Watt obtained it at Manipur, and *argyridina*, the dry form, was taken in January, in the valley of the Khoonah Khong, Eastern Manipur" (Ann. N. H. 1885, 340). Col. C. H. E. Adamson says, "I have caught this butterfly not uncommonly in Upper Burma, but only a single specimen in Lower Burma. The upper side varies in colour from shining white to a rich cream colour; the black markings also vary considerably in intensity" (List, p. 44). Dr. N. Manders found it "common in the Shan States at 3,000 feet elevation" (Tr. Ent. Soc. 1890, 534).

We possess specimens of the wet and dry form from Sikkim, Bhotan, N. E. Bengal, the Khasias, and Manipur; also the types of *pseudolaluge*, and both sexes of the *dry* form from the Karen Hills.

Of our illustrations on Plate 547, fig. 1, 1a are from a *wet-season* Sikkim male, and 1e, f, a Khasia female; fig. 1b, male of the *intermediate* form, from Sikkim. On Plate 548, fig. 1, 1a, 1b are from a *dry-season* Sikkim male and female types of *pseudolaluge*; 1c, a Silhet female; and 1d, e, a Sikkim female.

#### HYPOSCRITIA LAGELA.

Plate 548, fig. 2, 2a ♂, 2b, c ♀.

*Catophaga Lagela*, Moore, Proc. Zool. Soc. 1878, p. 838, pl. 52, fig. 4, ♀.

*Hiposcritia Lagela*, Adamson, List Burm. Butt. p. 44 (1897).

*Hiposcritia Lagela*, Butler, Ann. Nat. Hist. 1898, p. 394.

*Hiposcritia Pandione*, var. *Lagela*, Fruhstorfer, Iris, 1902, p. 284.

*Appias Lagela*, Distant, Rhop. Malay. p. 467, pl. 41, fig. 11, ♀ (1886).

*Appias Lalage*, Watson, Journ. Bombay Nat. Hist. Soc. 1891, p. 53; *id. l.c.* 1897, p. 670.

*Wet-season* Form. Male and female. Smaller than *Lalage*. Upperside. *Fore-wing*. Differs in the black apical border terminating, in both sexes, before reaching



the posterior angle, the medial portion being partly excavated outside the lower end of the cell, and thence extending across the end to its base. *Hindwing* with a broad marginal continuous band, similar to that in *Pandione*. Underside. *Forewing* with the black band terminating as on the upperside, the apex greyish-ochreous speckled with brownish scales and with slightly-defined whitish subapical spots. *Hindwing* pale yellowish-ochreous or greyish-ochreous in the male, more greyish in the female, speckled with brownish scales, and with a darker-scaled discal and submarginal zigzag fascia.

Expanse, ♂  $2\frac{1}{4}$  to  $2\frac{1}{2}$ , ♀  $2\frac{1}{2}$  inches.

HABITAT.—Tenasserim; Malay Peninsula.

DISTRIBUTION.—The type specimens were taken by Mr. Otto Limborg at "Moolai, Upper Tenasserim, 3,000 to 6,000 feet elevation" (P. Z. S. 1878, 838). Col. C. H. E. Adamson obtained a "single male, in Upper Tenasserim, in March" (List, p. 44). Col. C. Swinhoe possesses a male from Perak.

Of our illustrations on Plate 548, fig. 2, 2a are from a male in Col. Adamson's collection; fig. 2b, c, from the Moolai type in our possession.

#### HYPOSCRITIA INDRA.

*Wet-season Brood* (Plate 549, fig. 1, 1a ♂, 1b, c ♀).

*Pieris Indra*, Moore, Catal. Lep. Mus. E. I. Company, i. p. 74 (1857); *id.* Proc. Zool. Soc. 1857, p. 103, pl. 44, fig. 5, ♀. Wallace, Tr. Ent. Soc. 1867, p. 381.

*Hypocritia Indra*, de Nicéville, Journ. As. Soc. Bengal, 1885, p. 372. Fruhstorfer, Deuts. Ent. Zeit. "Iris," 1902, p. 283; *id.* Soc. Ent. 1903, p. 26.

*Tachyris Indra*, Elwes, Tr. Ent. Soc. 1888, p. 419.

*Hypocritia Indra*, Butler, Ann. Nat. Hist. 1898, p. 392. Swinhoe, Tr. Ent. Soc. 1893, p. 310. de Nicéville, Sikkim Gaz. 1894, p. 169.

*Pieris Colimba*, Boisduval MS. Moore, P. Z. S. 1865, p. 759.

*Hypocritia Shiva*, Moore, Journ. Linn. Soc. Zool. 1886, p. 49. Butler, Ann. Nat. Hist. 1895, p. 341.

*Wet-season*.—Male. Upperside greyish-white. *Forewing* with the base of costal border grey-black scaled and merging into a black broad apical outer-marginal decreasing band, which terminates narrowly at the lower median veinlet, the band curving outward from the costal border to upper median, then extends inward more or less quadrately in the next interspace, and again outward narrowly to the lower median; three or four white spots before the apex, the upper and lower the smallest; a minute black dot is generally present on the lower discocellular veinlet. *Hindwing* with a few black scales slenderly disposed anteriorly along outer margin and on tip of the veins, and a minute dot on upper end of the discocellular veinlet.



Underside. *Forewing* greyish-white ; with the outer black band subapically restricted and narrow, the apical area being pale yellow, the spots of upperside being slightly indicated, the black discocellular dot also visible. *Hindwing* pale yellow, with more or less very slightly-defined brownish-scaled discal and submarginal zigzag fasciæ, and a distinct black discocellular dot.

Female. Upperside fuliginous-black. *Forewing* with a central longitudinal greyish-white patch, its outer edge being sinuous and its basal area dark grey scaled; two small oblique subapical white spots; cilia white posteriorly. *Hindwing* with the basal and discal area greyish fuliginous-brown and the veins greyish-white lined, the cell and abdominal area with long fine grey hairs; two upper submarginal small greyish-white spots; cilia white. Underside. *Forewing* with similar black outer border, shaped as on upperside, the apex being ochreous-yellow, and the white spots less defined; discal area greyish-white, the base suffused with sulphur-yellow. *Hindwing* ochreous-yellow, very sparsely irrorated with minute brown scales, irregularly traversed by a discal and submarginal zigzag brown-scaled fasciæ, and outer marginal white interspaces; a brown discocellular dot.

Expanse, ♂  $2\frac{1}{2}$  to 3, ♀  $2\frac{1}{2}$  to 3 inches.

*Dry-season Brood* (Plate 549, fig. 1e, f, g, h ♂, 1d ♀).

*Appias Mahana*, Moore, Ann. Nat. Hist, 1877, p. 48, ♂. Adamson, List of Burm. Butt. 1897, p. 43.

*Hiposcritia Mahana*, Butler, Ann. Nat. Hist. 1885, p. 341, ♂.

*Hiposcritia imbecilis*, Moore, Journ. As. Soc. Bengal, 1884, p. 46, ♂. de Nicéville, *ib.* 1885, p. 51.

*Tachyris indigis*, Weymer, Stett. Ent. Zeit. 1887, p. 11, pl. 1, fig. 3, ♂.

Male. Somewhat smaller than *wet-season* form. Upperside. Similar. *Forewing* with narrower and less prominent black outer band, which ends usually above the lower median veinlet, and its enclosed white spots generally larger, there being usually five in number. *Hindwing* unmarked. Underside. *Forewing* with the outer black band narrower than in *wet* form and obsolescent posteriorly, or entirely absent, its position indicated only by a few dark scales, the apex being pale yellowish-white speckled with brownish scales. *Hindwing* pale yellowish-white, more or less speckled with minute brown scales and traversed by a discal and submarginal zigzag fascia, but in some specimens these brown scales and fasciæ are almost obsolete; the discocellular black dot always present.

Female. Upperside. *Forewing* with broader greyish-white area and less black-scaled posterior border than in *wet* form. *Hindwing* with the basal and discal area greyish-white, the outer black border enclosing a submarginal row of large whitish irregular-shaped spots. Underside similar to *wet* form. *Forewing* with the black outer band somewhat narrower and with a white spot at the posterior angle. *Hindwing* more numerous brown scaled.



Expanse, ♂  $1\frac{3}{4}$  to  $2\frac{1}{2}$ , ♀  $2\frac{3}{4}$  inches.

HABITAT.—Eastern Himalayas (Nepal, Sikkim; Bhotan); Assam; Lower Bengal; Manipur; Burma; Tenasserim; Malay Peninsula; Singapur; Cochin China.

DISTRIBUTION.—Mr. L. de Nicéville, in his MS. Notes on Pierinæ, writes, “It is very common in the Sikkim Hills, probably also in Nepal, the Bhutan Hills, throughout Assam, inhabiting Silhet, Cachar, and Manipur, throughout Burma as far south as Tavoy. It is very rarely found in the Plains of Bengal, I have two males taken in Calcutta and in Bholahat, Maldah District, in February, both these specimens being the extreme dry-season form named *Mahana* and *imbecilis*.” We possess a male from Nepal, taken by the late Gen. G. Ramsay, both sexes from Darjiling, Silhet, Assam, males from Manipur, taken by Dr. G. Watt, and a male from Calcutta taken by Mr. W. S. Atkinson. In the British Museum Collection are both sexes of the *wet* form from Sikkim, a male from Bhotan, both sexes from Shillong, Assam, the Khasias, males from Manipur (Dr. Watt), a male from Salween Valley, Burma, taken in November by Col. C. T. Bingham, and of the *dry* form males from Sikkim, Cherra Punji, Silhet, Assam, and Manipur. Mr. H. J. Elwes records it from Sikkim, “the male is not uncommon at low elevations from April to October, but the female seems much rarer, and I have not seen more than two or three in Möller’s collection” (Tr. Ent. Soc. 1888, 419). Col C. Swinhoe records it from “Shillong and the Khasias” (Tr. Ent. Soc. 1893, 310). Dr. G. Watt obtained it at “Manipur and the borders of Assam” (Ann. N. H. 1885, 341). Col. C. H. E. Adamson writes, “Taken abundantly in the Arakan Hills in April, also in Tenasserim in December. It has a habit of flying about the tops of trees, whence it descends to imbibe moisture from the damp sandy beds of streams” (List, p. 43). Dr. J. Anderson obtained “a single specimen of the female at Owen Island, Mergui, in January” (J. Linn. Soc. Zool. 1886, 49). It is also recorded from Singapore (Weymer, *l.c.*), also from Annam and Tonkin (Fruhstorfer, *l.c.*).

#### HYPOSCRITIA NARENDRA.

Plate 550.

*Appias Narendra*, Moore, Ann. and Mag. Nat. Hist. 1877, p. 48, ♂; *id.* Lep. of Ceylon, i. p. 134, pl. 51, fig. 4, 4a ♂ ♀ (1881). Butler, Proc. Zool. Soc. 1881, p. 611, ♀. de Nicéville, Journ. As. Soc. Bengal, 1899, p. 216.

*Hiposcritia Narendra*, Hampson, J. As. Soc. Beng. 1888, p. 362. Ferguson, J. Bombay N. H. Soc. 1891, p. 444.

*Hyposcritia Narendra*, Butler, Ann. Nat. Hist. 1898, p. 393.

*Wet-season Brood* (Plate 550, fig. 1, 1a ♂, 1b, c ♀).

Male. Upperside greyish-white. *Forewing* with a black broad apical band,



angulated on its inner edge, decreasing hindward to beyond the lower median veinlet, and enclosing two small oblique subapical white spots. *Hindwing* with a very narrow outer marginal black-scaled denticulated band. Underside. *Forewing* greyish-white, with a broad black subapical band, its inner edge as on upperside, the apex ochreous-yellow and brown-scaled, with indistinct paler spots. *Hindwing* ochreous-yellow, densely irrorated with brown scales and traversed by an ill-defined discal and submarginal zigzag fascia, the outer-marginal interspaces being less brown scaled; a discocellular black dot visible.

Female. Upperside greyish-white. *Forewing* with broader black apical band; its lower end reaching the posterior angle; two subapical white spots. *Hindwing* with a broader black marginal band and more or less slightly-indicated lower submarginal black lunularly-disposed scales. Underside similar to the male. *Forewing* with broader black subapical band, and darker brown apical scaling. *Hindwing* darker brown scaled, the submarginal interspaces paler, in some specimens almost white.

Expanse, ♂ ♀,  $2\frac{1}{2}$  to  $2\frac{3}{4}$  inches.

*Dry-season Brood* (Plate 550, fig. 1d, e ♂, 1f ♀).

Male. Somewhat smaller than *wet* form. *Forewing* with the black band somewhat narrower posteriorly, the portion projecting between the upper and middle median being more pointed. *Hindwing* with the marginal band slenderly indicated by a few black scales and vein tips. Underside similar. *Forewing* with the band narrower, as on upperside.

Female. Upperside. *Forewing* with the black band comparatively narrower, and more abruptly indented beyond the cell. Underside. *Forewing* with the band narrower, as on upperside. *Hindwing* more uniformly brown scaled.

Expanse, ♂ ♀  $2\frac{1}{4}$  inches.

*Extreme Dry Form* (Plate 550, fig. 1g, h, i ♂ ♀).

*Hiposcritia Shiva*, Swinhoe, Proc. Zool. Soc. 1885, p. 138, pl. 9, fig. 1, 2 ♂ ♀. Butler, Ann. Nat. Hist. 1898, p. 393. Fruhstorfer, Soc. Ent. 1903, p. 26.

Male. Upperside. *Forewing* with the black band somewhat narrower than in ordinary dry form, and sometimes having either three or four subapical white spots, the upper and lower being smaller and less distinct. *Hindwing* quite unmarked. Underside. *Forewing* with narrow black band, the apex paler than in ordinary dry form. *Hindwing* also much paler, the brown scaling distinct.

Female. Upperside. *Forewing* similar to the ordinary dry form, the black band being comparatively narrower. *Hindwing* with the marginal band narrower, less defined and almost or quite macular. Underside. *Forewing* with the black band narrower than in ordinary dry form, the apex and the *hindwing* paler, as in the male,



Expanse, ♂  $1\frac{6}{10}$  to  $2\frac{2}{10}$ , ♀  $1\frac{6}{10}$  to 2 inches.

HABITAT.—South India; Ceylon.

DISTRIBUTION.—We possess both sexes of the *wet-season* form from S. India, Nilgiris, Travancore, and the male type from Ceylon, also of the *dry-season* form from Poona, Bombay. In the British Museum Collection are specimens from Poona, Nilgiris, Anamally Hills, and Ceylon. Col. C. Swinhoe has a typical female of the *wet* form taken in Poona in September, and records the *dry* form (Shiva) from "Parbutti Hill, Poona, being very plentiful from December to April, but confined entirely to this Hill" (P. Z. S. 1885, 138). Mr. G. F. Hampson obtained it in Nilgiris, from "2,000 to 4,000 feet elevation" (J. As. Soc. Beng. 1888, 362). Mr. H. S. Ferguson found it "very abundant in the Travancore Hills, from 2,000 feet upwards" (J. Bombay N. H. Soc. 1891, 444). In Ceylon, Mr. F. M. Mackwood took it in the "Hills, from 2,000 to 4,000 feet" (Lep. Ceyl. i. 134).

INDO-CHINA AND MALAY SPECIES.—*Hyposcritia Pandione* (H. Pandione, Hübner, Zutrage, Exot. Schmett. fig. 651-2, ♂ (1832). Butler, Ann. Nat. Hist. 1898, p. 393. de Nicéville, J. As. Soc. Bengal, 1895, p. 502. Fruhstorfer, Deuts. Ent. Zeit. 1902, p. 283. Tachyris Pandione, Wallace, Trans. Ent. Soc. 1867, p. 381. *Habitat.* Java; Sumatra.

*Hyposcritia Whiteheadi* (Appias Whiteheadi, Grose-Smith, Ann. Nat. Hist. 1887, p. 434; *id.* Rhop. Exot. i. P. pl. 2, fig. 4, 5 (1889). Whitehead, Exp. N. Borneo, p. 118 (1893). Butler, *l.c.* 1898, p. 393. *Habitat.* Borneo.

*Hyposcritia Leptis* (Pieris Leptis, Felder, Reise Novara, Lep. ii. p. 163 (1865). Wallace, *l.c.* p. 373. Butler, *l.c.* p. 393. *Habitat.* Java.

*Hyposcritia plana* (Appias plana, Butler, Tr. Linn. Soc. Zool. i. p. 551 (1879). Distant, Rhop. Malay. p. 314, pl. 25, fig. 9 ♀). de Nicéville, Journ. As. Soc. Beng. 1895, p. 503. Tachyris Leptis, Kheil, Lep. Nias, p. 34 (1884). *Habitat.* Malay Peninsula; Sumatra; Nias.

*Hyposcritia Montana* (Appias montanus, Rothschild, Nov. Zool. iii. p. 325 (1896). Butler, Ann. Nat. Hist. 1898, p. 394. *Habitat.* Philippines.

*Hyposcritia Phæbe* (Pieris Phæbe, Felder, Wien. Ent. Monats. 1861, p. 299; *id.* Reise Nov. ii., p. 163, pl. 25, fig. 5 (1865). Semper, Reise Phil. Lep. p. 248, pl. 39, fig. 5 ♂). Butler, *l.c.* p. 294. Tachyris Phæbe, Wallace, Tr. Ent. Soc. 1867, p. 382. *Habitat.* Philippines.

*Hyposcritia Lageloides* (Hip. Lageloides Crowley, Proc. Zool. Soc. 1900, p. 509, pl. 35, fig. 2. Hip. Lalage, Fruhstorfer, Iris, 1902, p. 284; *id.* Soc. Ent. 1903, p. 26. *Habitat.* Hainan; Tonkin.

*Hyposcritia Nupta* (Hip. Lalage, *var.* Nupta, Fruhstorfer, Ent. Nachr. 1897, p. 63. *Habitat.* Nias.



## ADDENDA.

Page 144. Genus **BALTIA**.

**BALTIA SIKKIMA**, Fruhstorfer, Iris, xvi. p. 50 (1903). "Male. Smaller than *Butleri* and *Shawii*, and with more pointed form of wing. The black spot at apex of the cell wider than in *Butleri*. All the wings bear above as well as below, a row of four or five grey-black marginal spots, and a narrow black submarginal band. Also the cell of the hindwing is bounded above with black. On the underside the base of all the wings is scaled with black. The apical portion of the front wings, and the hindwings, are ornamented with yellow lines between the veins, moreover there is a yellow stripe through the cell" (*Fruhst. l.c.*).

**HABITAT.** Upper Sikkim; June and July (1902), at 12,000 to 15,000 feet.

Page 203. **APPIAS LIBYTHEA**. By the kindness of Mons. Charles Oberthür—who now possesses the Collection of Lepidoptera described by Dr. Boisduval in the "Spec. Gen."—we have (June, 1905) examined and verified the type specimen of *Pieris Rouxii* as being identically the same as the male of *Libythea*, as we had herein placed it.







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LEPIDOPTERA INDICA.







# LEPIDOPTERA INDICA.

BY

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OF LONDON; CORRESPONDING MEMBER OF THE ENTOMOLOGICAL SOCIETY OF STETTIN,  
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OF BENGAL.

VOL. VI.

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**RHOPALOCERA.**

FAMILY PAPILIONIDÆ.

SUB-FAMILY PAPILIONINÆ (CONTINUED).

FAMILY PIERIDÆ.

SUB-FAMILY PIERINÆ.

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